

AMERICAN

RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, *Editor.*

ASSISTANT EDITORS:

JAMES T. HODGE, *For Mining and Metallurgy.*

CHARLES T. JAMES, *For Manufactures and the Mechanic Arts.*

M. BUTT HEWSON, *For Civil Engineering.*

SATURDAY, JANUARY 26, 1850.

Second Quarto Series, Vol. VI., No. 4.---Whole No. 709, Vol. XXIII.

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American Railroad Journal.

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Saturday, January 26, 1850.

Lead Ores.

ROSSIE LEAD MINE—ST. LAWRENCE COUNTY, N. Y.

The Reports of Dr. Beck and Dr. Emmons, State Geologists, contain minute descriptions and illustrations of the mines of Rossie, examined by the latter at different times in the course of the survey. And an anonymous article in Silliman's Journal, vol. XLII., contains farther details. From the style and character of this article it seems entitled to more credit, than ought as a general rule to be given to anonymous articles on mines.

Several veins have been discovered in the vicinity of the one known by the name of the Rossie Lead Mine or the Coal Hill Mine. I shall, however, confine my remarks to this, which is the principal one. The locality is about six miles from the River St. Lawrence, and eighty rods from Indian river, two miles from its entrance into Black Lake. The village of Rossie is $2\frac{1}{2}$ miles north of the mine. The rock formation is gneiss containing much horn-

blende; over this comes in the Potsdam sandstone within no great distance to the North. The veins however appear to be confined to the gneiss rock. "This is distinctly stratified, but its strata are remarkably contorted and twisted. The surface is quite uneven and broken by protruding ledges, whose ranges vary from northeast to northwest; it is in a line nearly perpendicular to these ranges that the veins of lead are found. The Coal Hill mine was first discovered upon the face of one of those ledges, which was between sixty and seventy feet in height. When first uncovered, it presented the appearance represented in the cut.* The whole vein in the face of the ledge was thus laid bare, the galena appearing in the central part of the calcareous spar in a white or silvery stripe, being coated with disintegrated carb. lime, mixed, it is said, with a small quantity of carb. lead." "The vein is four feet wide, and is filled with calcareous spar and galena, the latter having only a width varying from two or three inches to eighteen; probably the average width is about 10 inches. Its direction is south 82° east, (or according to Dr. Beck, SSE, NNW), and its dip about 85° north. The galena is distributed through the gangue of spar rather sparsely at some points of the vein, but generally it is disposed in nearly parallel lines in the form of subordinate veins. Large masses of lead are occasionally met with weighing several hundred pounds."

"The Coal Hill mine has been worked to the depth of 200 feet. The mining has been carried on by two distinct companies—the eastern division or section by the Rossie Lead Mining Company, and the western section by the Rossie Galena company. Of the profits which have accrued to either of these companies, the public have never been furnished with official reports. There is no doubt, however, but losses have been sustained by both companies. The pressure of the times, the fall of the price of lead, but more than all, the interest upon the capital of the purchase money, not only must have been a great drawback on immediate profits, but must have rendered the prospects in future hopeless. That the owners may succeed in working this vein at a profit is highly probable."†

The situation of the mine does not appear to be very favorable for working. The country around

* The cut referred to will be given in our next number.

† Prof. Emmon's State Report, p. 355.

it is low and swampy, and though six miles from the St. Lawrence, and in the midst of hills, their bases are only 150 to 200 feet above its level. The rock however is described in Silliman's Journal as having few fissures, through which water is discharged, and hence is kept easily dry. He considers that the mine must eventually be wrought to profit, and that the ore is inexhaustible. But besides the trouble of water, it has another to contend with, from which the great western mines are principally free. The ore occurs so intimately mixed with the gangue, that it cannot be taken directly from the mine to the furnace, but must first be subjected to an expensive process of crushing and jigging and washing. And as at the greatest depth attained, the proportions of ore to the gangue did not seem to increase, there is little hope that this labor may be in any wise diminished. The operations both of mining and smelting appear to have been conducted at these works with more liberality and skill than is found at the western lead mines.

The furnace operations, to which I shall refer again in the account of the Wisconsin mines, were well managed, as the piles of slag now lying around them fully testify, being as I am informed by an intelligent smelter from Wisconsin, who has carefully examined them, apparently quite clean of lead, strikingly different from the slag at the west. "The amount of lead smelted from the mines in 1837 and 1838 was 4,137,871 lbs.; in 1839 about 1,200,000 lbs.; in 1840 about 400,000 lbs."—Silliman's Journal.

The ore occurred for the most part crystallized in large cubes, and in a variety of modifications derived from this form. A portion was fine granular ore like that known at the west as "steel-grained." Few localities in the United States have furnished more splendid crystals and a greater variety than this vein. The crystals of galena were usually found in groups lying in the calcareous spar, precisely it appears like the groups of crystals of native copper in the calc. spar veins of Lake Superior. Single crystals sometimes weighed thirty-five pounds; and in their forms they presented many of the numerous modifications belonging to the passage of the cube into the regular octahedron. The calc. spar gangue was also itself highly crystallized and in a variety of the modifications of its common form. The finest specimens of double refractive carb. lime probably ever found in the country, are from this vein. The crystals of sulphuret of

iron in forms between the cube and pentagonal dodecahedron are also of singular beauty and perfection. Copper pyrites and blende are associated with these, the latter however of rare occurrence; and some beautiful specimens of crystallised sulphate of strontian of a blue color have been found.

Two analyses were made by Dr. Beck of the galena with nearly the same results—one gave sulphur 13.2, lead 85.4, carb. lime and loss 1.4 per ct. The specimen was part of a cubical fragment, its specific gravity 7.5; a minute proportion of silver was found, but too little to be of any practical importance.

This no doubt is one of the most promising lead mines of all those opened in the Eastern States north of Virginia. From the number of other veins like it in the same vicinity, it would seem that nature might have intended this originally for a lead district, and that it is still possible it may yet prove of this character. But as it is not found to be sufficiently productive to compete with the western mines, notwithstanding all its favorable features and the skill and enterprise brought to bear upon the development of its resources—the chance of other mines not so promising in their indications is certainly much lessened.

H.

Memoranda on Brooklyn Water Works.

Brooklyn, a city of some hundred and twenty thousand people, and situated at the centre of the commercial activity of this Continent, is up to the present moment dependant on pumps and cisterns for a supply of the first necessary of life—water. With the magnificent example of this city, and also the splendid example of Boston taunting the people of Brooklyn, it is quite time that they should move seriously in a measure for supplying themselves with what, in reference to health and cleanliness, is the best preserver of life, and in reference to accident and incendiarism, is the best preserver of property. The sanatory inquiries in Great Britain and Ireland have brought out medical facts on the subject of water—supplies which may well startle a people of even stupid indifference or sluggish energies, and which amongst a people so active and intelligent as our neighbors of Brooklyn, have already acted as stimulants to exertion. Apart from the consideration of water works as the only means of supplying by proper filtration, to a large city pure water for personal cleanliness and health, we may observe that such works must be the forerunner of all others of sanatory improvement.—The deposit of a city of 120,000 people might be estimated at some 300,000 tons; and without a sufficient supply of water to sweep this deposit, thro' proper sewers into the natural outlet, the citizens must inhale an atmosphere poisoned with the gases evolved from the decomposition of some eight tons of fetid animal and vegetable matter per hour.—The effects of such an atmosphere are not observed by individual experience: but extended observation traces most distinctly to this and such local causes, the variations of longevity and the prevalence of disease. Further, as a matter of commercial economy to a community, water-works are a decided saving: besides the increased supply, the saving of money in cisterns, pumps, carriage, they will in a large city almost liquidate their cost by the saving effected under the head of insurance. Insurance on house property in New York fell on the opening of the Croton aqueduct fully 25 per cent., and is at this moment lower by that per centage than the insurance on property of the same kind in the city of Brooklyn.

Major Douglass, the able Engineer of the Cro-

ton aqueduct has published a report on the means of supplying Brooklyn with water. He discusses 3 propositions that had been mooted in the case; and in the outset condemns the first of these—that for drawing the supply from the Croton aqueduct. We quite agree that such a course as this would be highly injudicious, seeing that independant of any other objection we must expect that in the ordinary course of its progress, New York will soon require for its own people the undivided supply of the Croton aqueduct. The two other suggestions discussed are: the one that the city be supplied by regularly graduated catchment-drains, contoured for the necessary distance a little above the level of the sea; the other that it be supplied by large wells sunk to such a level as to collect the waters supposed to be held at present within the loose material of Long Island. The Major supports this last proposition. He grounds his decision in the case on the supposition that the Island being generally a loose gravel formation, the rain falling on it is held in suspension within the strata until such time as it can by hydrostatic pressure percolate into the river on the one side or into the ocean on the other. In support of this premiss the Major remarks that a glance at the map of Long Island will show in the fewness of its ponds and water-courses the absorbing character of its strata generally, and that when a pond or a water-course does occur, it always indicates a change in the formation. These as well as we can remember them are the views put forward by Major Douglass in his report on the supply of water to Brooklyn.

M. Arago states that only one-third of the water falling in rain on the basin of the Seine passes into the sea through that river; the other 2-3ds being therefore distributed under the heads of evaporation, the support of vegetable life, and subterraneous drainage into the sea. Mr. Rennie's experiments on the discharge of the Thames would go to fix nearly the same proportion between the drainage of that river and the rainfall on its basin; but of the remaining two-thirds in this latter case, a proportion passes off through the apertures of the chalk formation, inasmuch as besides the fact of those apertures being large and numerous the Artesian wells in the valley of the Thames always yield a supply after the boring has passed through a bed of chalk resting on the impervious 'London clay' of the district. Now it is quite uncertain what amount of rain may be held by the strata in either of those cases; but if we were to form an idea of the amount from the supplies furnished by the Artesian wells of London or Paris, we should fix it at a very low figure. The Artesian wells of London require constant deepening, and like those of Paris show a constant falling of the water-line to the extent of from twenty to sixty feet; and yield a supply so very scanty that in London, where with a depth of several hundred feet, they would be expected to command an immense range of basin, the brewers who draw from them have been obliged to make an arrangement that each will draw from his well on different days. But will not the peculiar circumstances of the rain-fall in this country make the quantity absorbed less than in either Paris or London? This would look very likely.—In the latter the rain-gauge shows a series of long continued, drizzling falls: but here the rain falls generally in comparative torrents—to the extent in New York of an inch per hour for the maximum fall, while in London the maximum fall is about one inch in twenty-four hours. On this proportion rain in England would be absorbed as 24, while

here (the strata being alike) it would be absorbed in the proportion of only 1. This is certainly the extreme case: but it may be safely inferred that a much larger proportion of rain is discharged over the surface in the neighborhood of New York than over a like surface in the neighborhood of London or Paris. The question then becomes: How far does the greater absorbing powers of the Long Island formation affect the case? Nobody can tell; and therefore we must wait for further facts before we can pretend to fix the probable limit of supply from wells of the sort recommended by Major Douglass.

It is a well known fact that the wells in the London district are strongly impregnated with the peculiar components of sea water; and we would hesitate therefore to incur such a liability under circumstances so predisposing to that result as the narrowness of Long Island and the looseness of its soil. Besides: it seems likely that the direction of the drainage of the island being from the middle, towards the sound on one side and towards the sea on the other, any water absorbed in a material so loose will pass over the short and rapid incline into the natural outlet very rapidly. In fact it would seem probable that if the soil absorb quickly it must give out quickly; and that therefore the supply would not be constant.

All these remarks are simply speculations in the absence of facts; and are stated here to urge on the Brooklyn people the wisdom of Major Douglass's advice as to the necessity for a careful scientific survey. In the first place, a series of sections at certain intervals should be taken across such portion of the Island as may be necessary to furnish the proper supply of water; and from the levels (above high water) so obtained a set of contour lines should be laid down on the map in order to ascertain the number of acres situated above the several levels of the several contours. Along the several lines of section, boring should be made with (for ordinary depths) the borings rod described in the number of this Journal for the 4th of August, 1849, and the result of these borings, including also the level at which water was met (and if possible whether the same were fresh or salt), should be registered on the section. Every spring and stream within the limit of inquiry should be shown on the map, and each made a subject of the strictest inquiry with a view of ascertaining: 1st, for springs, the level at which each issues, the amount and variations of its discharge in dry and in wet weather, etc.: 2d, for streams, the average grade, the minimum and the maximum section, the continuance of floods, etc. By means of the borings, the lie of the strata might be laid down, and the area of any impervious bed calculated. When these and such other facts as might arise in the course of the inquiry shall have been ascertained satisfactorily an intelligent engineer will be in a position to make up his mind as to the best means of supplying the city of Brooklyn with water; but in the face of the many grounds of apprehension suggested above, we would earnestly caution the people of Brooklyn against running into any outlay for water-works until such information shall have been collected to the fullest extent, and collected too under enlightened direction.

M. B. H.

Our Virginia exchanges state that the house of delegates passed a bill authorizing a subscription by the State of forty two thousand dollars to the stock for constructing a railroad from Staunton to Covington; and also a bill guaranteeing the bonds issued by the town of Petersburg as subscription

to the Southside railroad. In discussing the former bill in the house of delegates Mr. Segar made a speech of which we extract the following portions from the Norfolk Whig:—

The third impediment to the cause of internal improvement, whose operation will be more disastrous for the future, and end unless removed, in the entire destruction of the system, is the loose and disjointed policy we have hitherto pursued. Our plan has been that of local appropriations—of local improvements. Made as they have been, and as they must, without a change continue to be, without reference to a fixed system, composed of leading lines of improvement, the aggregated debt of the state is rapidly enlarging, and without any prospect of returning profit. Gentlemen know well the operation of this policy. One county asks an appropriation for a mere neighborhood work—a road, perhaps, from one court-house to another: a second asks another, and a third, and a fourth, and so on, until the amount is prodigiously swelled by the aggregate of these many appropriations. Look at your table, groaning under the weight of petitions coming from all quarters of the state for grants of money. What is the result? That no discrimination is made between those works which promise to be profitable and those which do not. The resources of the state are frittered away on local and unprofitable works, instead of being expended on great central lines that will return the interest and principal of investment. The ultimate consequence will be, that the whole policy of internal improvement will be cast into disrepute. The fund for internal improvement becomes charged with unavailable works.—As the evil progresses taxation is increased to sustain this loose system—and finally, the people, looking to the profuse expenditure and seeing nothing coming in, will become dissatisfied with the whole policy of improvement, and in disgust abandon it forever.

Now this evil must be eradicated, and it can only be done by adopting a *system*, in contradistinction to the lax policy of our past legislation. The wound upon the body politic is them cut off with a sword, for both systems cannot co-exist, while the local plan would, of itself bankrupt the commonwealth by creating a perpetual charge upon the treasury. The moment we adopt a *system*, applications for local appropriations either cease to come to this body or they will lie unheeded on the table. When they reach us, we have the ready reply—"The faith of the state is already pledged to the full amount of her means, to certain central and general improvements—you must wait until these are completed—when completed, they will yield us profit, and then we shall be ready—for we shall have the greater means—to supply the wants of every section of the commonwealth.

Let not western gentlemen imagine that by this plan their local demands are indefinitely postponed—the postponement will be temporary only. Nor on the other hand, let eastern delegates suppose that the change of policy recommended by the committee, will increase the burthens of taxation. It can be shown, that it is the peculiar interests of the eastern people, to repudiate the plan of local appropriations, as it is peculiarly the interest of the western to except in exchange the system of general improvements. First, with respect to the east: The internal improvement fund is already charged with many unprofitable works—unprofitable, because of their local character. The aggregate is increasing and must increase, unless arrested in the mode now recommended. A debt of principle will therefore be constantly accumulating, which will make little or no return of interest. Substitute the general for the local, and an unprofitable is exchanged for a profitable system—for it will be shown in the sequel, that the routes recommended will yield a fair income. If, then, economy be the object of gentlemen, and they really wish that expenditures contributed by them for the outlay, they can only attain their object in one of two ways—either by stopping all public works, or adopting a system of general improvements.

And, for the like reason, it is the peculiar concern of the west to make the exchange advised by the committee. Let her not persist in a system which, while it dispenses but little good, will lose her friends in the east, and fix in the public mind

insuperable distaste to all improvement. How much more, said Mr. S., are the citizens of middle and western Virginia interested in works of a general character? Let the great central lines or stems be constructed, and local or lateral improvements follow necessarily. Then, to, the latter, communicating with the former, cease to be mere neighborhood works, ensuring profit and promoting accommodation; whereas now they do neither to any available extent. Open their grand reservoirs and innumerable streams will glide to their bosoms, swelling by their tribute, their recipient channels into broad volumes, whose strong current enriching wherever it passes, shall roll into the Atlantic cities exhaustless stores of wealth.

These observations are full of good sense. A desultory system of railroad improvements must necessarily be inefficient and wasteful. We regret that Mr. Segar did not reduce his views to a practical application by urging on the House of Delegates some specific measure of remedy. There can be no doubt that a local improvement can have no claim to State support: and as in the confusion of desultory works it is quite impossible to say absolutely what is local and what is not, it becomes a matter of conscience with the representatives of the people at large to decline an appropriation for almost any road in the absence of a general design. There are points which are defined by the economic conditions of a general carrying trade as absolute centres for that trade; and until these points are established and wrought into an economic system of intercommunication we remain in quite as much doubt as to what is local as we do in reference to what is general. Let therefore a state legislature who would disburse the public money with business-like prudence—who would in fact apply it to works that must of a certainty yield the public not only a return, but the highest return on the monies by a development of industrial resource—lay down from the fullest information a map fixing absolutely for their State those lines of transit defined by the position of the State in reference to other States, and by the agricultural, geological, and other statistics of the State itself as lines of public importance. These should be comprehensive in their range, and being as it were the arteries of a system, might be made to control—in fact to define the whole system of minor channels. A map of this sort will show people what is to be done, and where to begin; it will give point and purpose to public improvements, will give a healthy impetus to railroad enterprise, by pointing out from the fullest information the particular work that must be the forerunner of improvement in any given direction; and will enable private associations to know at the very starting, whether and how far they may count on the support of the public in the object of their particular association.

IMPENETRABILITY AND COMPRESSION OF AIR.

Let a small piece of cork be placed floating on the surface of water in a basin or other vessel, and an empty glass goblet be inverted over the cork, so that its edge just meets the water. A portion of air will then be confined in the goblet, and detached from the remainder of the atmosphere. If the goblet be now pressed downwards, so as to be entirely immersed, it will be observed that the water will not fill it, being excluded by the impenetrability of the air enclosed in it. This experiment, therefore, is decisive of the fact, that air, one of the most subtle and attenuated substances we know of, possesses the quality of impenetrability. It absolutely excludes any other body from the space which it occupies at any given moment.

But although the water does not fill the goblet, yet if the position of the cork which floats upon the surface be noticed, it will be found that the level of the water within has risen above its edge or rim. In fact, the water has partially filled the gob-

let, and the air has been forced to contract its dimensions. This effect is produced by the pressure of the incumbent water forcing the surface in the goblet against the air, which yields until it is so far compressed that it acquires a force able to withstand this pressure. Thus it appears that air is capable of being reduced in its dimensions by mechanical pressure, independently of the agency of heat. It is compressible.

That this effect is the consequence of the pressure of the liquid, will be easily made manifest by showing that, as the pressure is increased, the air is proportionally contracted in its dimensions; and as it is diminished, the dimensions are, on the other hand, enlarged. If the depth of the goblet in the water be increased, the cork will be seen to rise in it, showing that the increased pressure, at the greater depth, causes the air in the goblet to be more condensed. If, on the other hand, the goblet be raised toward the surface, the cork will be observed to descend towards the edge, showing that as it is relieved from the pressure of the liquid, the air gradually approaches to its primitive dimensions. —*Magazine of Useful Knowledge.*

Case-Hardening.

Is the name of the process by which iron tools, keys, &c., have their surfaces converted into steel.

Steel when very hard is brittle, and iron alone is for many purposes, as for fine keys, far too soft. It is therefore an important desideratum to combine the hardness of a steely surface with the toughness of an iron body. These requisites are united by the process of case-hardening, which does not differ from the making of steel, except in the shorter duration of the process. Tools, utensils, or ornaments intended to be polished, are first manufactured in iron and nearly finished, after which they are put into an iron box, together with vegetable or animal charcoal in powder, and cemented for a certain time. This treatment converts the external part into a coating of steel, which is usually thin, because the time allowed for the cementation is much shorter than when the whole substance is intended to be converted. Immersion of the heated pieces into water hardens the surface, which is afterwards polished by the usual methods. Moxon, in his *Mechanic Exercises*, p. 56, gives the following receipt for case-hardening:—"Cow's horn or hoof is to be baked or thoroughly dried and pulverized. To this add an equal quantity of bay salt; mix them with stale chamber-ley or white wine vinegar: cover the iron with this mixture, and bed it with the same in loam, or enclose it in an iron box; lay it on the hearth of the forge to dry and harden: then put it into the fire, and blow till the lumps have a blood-red heat, and no higher, lest the mixture be burnt too much. Take the iron out, and immerse it in water to harden." I consider the vinegar to be quite superfluous.

I shall now describe the recent application of prussiate (ferrocyanate) of potash to this purpose. The piece of iron, after being polished, is to be made brightly red-hot, and then rubbed or sprinkled over with the above salt in fine powder, upon the part intended to be hardened. The prussiate being decomposed, and apparently dissipated, the iron is to be quenched in cold water. If the process has been well managed, the surface of the metal will have become so hard as to resist the file. Others propose to smear over the surface of the iron with loam made into a thin paste with a strong solution of the prussiate, to dry it slowly, then expose the whole to a nearly white heat, and finally plunge the iron into cold water, when the heat has fallen to dull redness. —*Magazine of Useful Knowledge.*

Institution of Mechanical Engineers.

At a meeting of the above institution held at Birmingham, November 24th, R. Stephenson, Esq., M. P., in the chair, the following papers were read: *On the Construction of Railway Axles.*—By J. E. M'Connell.

Continued from page 40.

It has always been considered that having first ascertained, from example and experience, the strength of sectional area necessary, under every circumstance, to sustain the load which the journal has to carry, the length of it was determined by the velocity or amount of friction to which it is liable. Judging from axles at present in use in

carriages and waggons, the length of bearing is twice the diameter of the journal: but on this, as well as other points on strength of material, there exists a great variety of opinion. Even the forms of journals are found to differ very much. Without attempting to decide on the merits of any of them I shall in the present instance content myself with stating that all my experience has proved the desirableness of maintaining rubbing or wearing surfaces of bearings as free as possible from sharp abrupt corners, sudden alterations in diameter, or sectional strength. Having thus treated the journals as regards the load and the friction upon them, I now proceed to estimate the various strains to which the axle is exposed whilst in motion.

The first strain to which the axle is subject is that arising from the weight of the wagon and load, which being received or resting on the journal, produces the greatest effect upon the axle at the outer face of the wheel-boss, and to which is to be added the momentum of the load in falling through spaces caused by inequalities or joints of rails. The injurious consequences of inequalities on the road, surface, and flat places on the surface of the wheel-tyre, upon the axle, by the jolting or perpendicular motion which they produce, cannot be accurately estimated, and these are very much increased when the bearing springs of the wagon or carriage are not sufficiently elastic, and do not yield to the shock or blow downwards, so as (to use the expression) to cushion its effect. As an instance of the imperfect action of the springs, I would allude to those in use on many wagons, in which the form and construction cause them to be so rigid that the downward blow is more like a hammer upon an anvil. To obviate this strain as much as possible, it is necessary to proportion the spring so as to sustain the load properly, and yet to be of sufficient elasticity to absorb the effect of the load oscillation. The strain arising from the oscillation of the wagon on curves from imperfect coupling, and increased by the lateral freedom or space on the bearings or play between the rails and flanges of the wheels which, when an irregularity occurs on the side of the rail, or any sudden cause disturbs the direct motion of the wagon onwards, is in effect the same as a blow upon the flange of the wheel, the radius of the wheel tending to act as a lever to break the axle at the inner face of the boss of the wheel. This strain is the compound ratio of the momentum of the load, the angle at which the wheel strikes the rail, and the distance from the centre of the axle to the point of impact: producing an effective strain upon the axle at the inner face of the wheel boss, which extends proportionately over the whole axle between the wheels. To lessen in practice as much as possible the deteriorating effect of these descriptions of strains upon the axle, the following conditions are important:—

That the bearings or journals of the axle fit as closely to the brasses as is consistent with freedom, the allowance of flange gauge of wheel being quite sufficient for the carriage to move freely round curves and meet any irregularity in the gauge of the rails. That the wagons or carriages be as equally loaded as possible, and the draw-chains be exactly in the centre; and as side chains are dangerous, they should be completely removed, provision being made for a duplicate centre draw-chain should a failure occur. As the damage to the loading of wagons is in proportion to the oscillation, they should all be screwed together by means of screw-couplings having spring buffers upon both ends of every wagon. It is well known that the injury to the wagon, to the load which it conveys, to the axle which carries it and to the road over which it runs, is very much aggravated if the wagons are allowed to oscillate from side to side, and become like so many battering-rams, injuring themselves and all substances in contact with them. A train of wagons or carriages should be jointed together similar to the vertebrae of an animal, by which means any sudden lateral action would be neutralised by the support derived from the neighbouring vehicle. The road to be kept as accurate as possible to gauge and line. The third class of strains to which axles are liable are the shocks produced by starting and stopping a train, and which are in proportion to the momentum of the wheel and axle at the time of collision when stopping, and to the velocity of the impelling force and the inertia of the wheel and

axle when starting these strains are felt principally on the neck of the journal. Fourth strain, the torsion or twisting produced owing to wheels travelling over curves of the line; the difference in length of surface of the inner and outer rail compels the one wheel to grind or slide upon the rail, while the other is free to roll. This strain is proportionate to the load on the wheel, determining the amount of friction upon the rails, and the length of axle between the wheels; a slight amount of torsion is also produced from any variation in the diameter of the wheels on the same axle, by any inequality of load upon each journal, the quality of the brasses, or the amount of lubrication proportionately, and the strain of the break-block on one side, because when any of these occur separately or jointly, one half of the extra strain on one journal is transmitted through the axle to the other, and twisting or weakening the axle is necessarily produced. To lessen the amount of the above strain, it is obvious that the wheels should be kept in the best possible state of repair, so far as equal diameters and true circular surfaces are concerned, the wagons or carriages should be loaded equally on each side, the journals carefully lubricated, and all break blocks to bear the same pressure on both wheels of the same axle. Fifth strain, the constant vibration of the whole axle. This is more particularly the case, and is accelerated when the axle is fixed in a rigid, unyielding wheel. My experience has proved that the axles fixed in cast iron wheels are very much more liable to deterioration than those in wrought iron wheels, and the jar or vibration tending to deteriorate the quality of the iron, by altering its texture from fibrous to crystalline, is clearly visible in its effects in several fractures which I have seen. It would appear that the cast iron wheel acted more like a hammer on the axle, and as in the cold-swaging process a gradual breaking up of the fibre at the back of the wheel goes on, which is shown by an annular ring, varying from $\frac{1}{8}$ inch to $\frac{1}{4}$ inch in breadth, the strength is completely destroyed of this outer portion, and a sudden shock of the wheel upon some point of the road completes the fracture.

Among other causes which contribute to the deterioration of axles may be mentioned—the practice of throwing cold water on the axle to cool it, when it has become nearly red hot for want of proper lubrication in the journal. With regard to the strain to which the portion of the axle between the wheels is subject, there can be no doubt if the form of the axle is so proportioned that any blow transmitted through the wheel is received equally along the whole body of the axle, and the sectional strength at each point is fairly balanced to resist the effect of the blow, the axle will then be best suited to prevent deterioration at any particular place. With the view of determining the weakest point of a common wagon axle under different circumstances, I made a few experiments, as follows:

In the first experiment the power was applied to the flange of the wheel, and the resistance (as in the case of a railway axle when running) at the centre of the opposite wheel; the result was that the axle began to bend from a straight line $12\frac{1}{2}$ in. from the boss of that wheel to which the power was applied, and there is no doubt that if the power had been continued the fracture would have taken place within the $12\frac{1}{2}$ inches.

As a proof of this, in the second experiment, an axle of precisely the same dimensions and form, on being bent alternately backwards and forwards (the power being always applied on the same wheel at opposite points) was broken at the twelfth time of bending, within 6 inches of the back of the wheel.

In the third experiment the power and resistance were exactly in a parallel line to the centre of the axle, and the result, as might be expected, was a curve of a nearly uniform radius; proving that although the form of this axle was adapted to receive the blows of both wheels at precisely the same instant, and to the same extent (an impossible circumstance in practice), it was not suited to receive alternate strains or shocks, to which all axles are subject in ordinary use. The sizes of the axles in the above three experiments were precisely alike.

In the fourth experiment another axle of the same dimensions was taken, and reduced at the centre in a lathe to the following dimensions: The axle was divided into eight equal spaces from the

back of the wheel to the centre of the axle. Immediately at the back of the wheel the axle was 4 inches diameter, and the deflection was $9\frac{1}{4}$ inches; at the first space the diameter was $3\frac{1}{2}$ inches, and the deflection $8\frac{1}{4}$ inches; at the second space the diameter $3\frac{1}{16}$ inches, and deflection 7 inches; at the third space the diameter $3\frac{1}{16}$ inches, and deflection $5\frac{1}{4}$ inches; at the fourth space the diameter $2\frac{15}{16}$ inches, and deflection $4\frac{1}{4}$ inches. Up to this point the axle maintained a straight form from the back of the wheel: and from this point to the centre of the axle, as shown by the deflections, it assumed a fair curve, proving that the axle was weaker towards the centre than it ought to have been, and that the first 12 or 14 inches from the wheel having maintained the straight form was stronger in proportion.

In the fifth experiment the axle was reduced to $2\frac{1}{4}$ inches in the centre, and with power applied similar, as in the last case, the weakness at the centre was more perceptible.

In the sixth experiment the axle was made of another form, weaker immediately at the back of the wheel and at the centre. We had here two bends or curves, with a straight portion between them.

In the seventh there was an improvement upon the sixth, but it did not realise a perfect balance of strength at the different points.

In the eighth experiment, this was fairly accomplished, the proportion being as follows: From the back of the wheel to the centre of the axle, the sizes were 4 1-16 inches diameter, $3\frac{1}{4}$ inches diameter, 3 inches diameter, $2\frac{1}{2}$ inches diameter, 2 13-16 inches diameter, $2\frac{1}{4}$ inches diameter, 2 11-16 inches diameter, 5 11-16 inches diameter, $2\frac{1}{4}$ inches diameter; the half-length of the axle being divided as before, into eight equal spaces.

To be continued.

Finances of Maryland. Treasurer's Report.

We copy below, from the Baltimore American, the following abstract of the annual report of the Treasurer of the State of Maryland, for the fiscal year ending 1st December, 1849. The receipts and disbursements for the year are thus recapitulated in the report:—

Balance in the Treasury on the 1st December, 1848.....	\$315,495 32
Receipts in the year ended 1st December, 1849.....	1,315,439 80
Derived from the following sources, viz:	
\$403,270 12 from direct taxes which accrued in the year.	
151,744 27 from direct taxes of former years.	
192,010 87 from other than direct taxes (which accrued in the year) and were levied under acts to aid in paying interest on the public debt.	
12,759 71 from like taxes of former years.	
228,569 77 from internal improvement companies.	
1,705 52 from loans on account of Tobacco Inspection.	
1,539 35 from bank bonus, and a sale by Deputy Attorney General.	
260,146 23 from ordinary revenue (which accrued in the year.)	
9,672 78 from like revenue (which accrued before.)	
1,273 69 from repayments.	
12,356 71 from tax for colonization.	
37,590 78 from State Tobacco Inspection.	

\$1,315,439 80 making an aggregate of.....\$1,631,385 12
The disbursements in the same year amounted to.....1,146,492 16
And were on the following accounts, viz:

Interest on the public debt.....	\$715,555 95
Redemption of funded arrear interest.....	260,307 81
Annapolis & Elk Ridge railroad.....	3,935 56
Maryland Penitentiary.....	3,750 00
Public buildings at seat of government.....	28 62
State Colonization and Colonization Society.....	10,631 11
State Tobacco Warehouses and Inspect'n.....	24,263 91
Ordinary expenses.....	128,019 20
	\$1,146,492 16
Leaving in the treasury 1st December, 1849, a balance of.....	484,892 96

The estimated receipts for the current year are set down at \$1,218,580 68.

The expenditures for the current year are estimated at \$912,036 09.

The Treasurer goes on to say—

The foregoing report exhibits a state of prosperity in the fiscal condition of the state, surpassing the anticipations of the most sanguine; and highly creditable to the wisdom and firmness of those who originated and consummated the measures which have led to such auspicious results.

The annual reports for the last five years show a progressive improvement in the receipts from internal improvement companies, and from those sources of revenue which have been provided to aid in paying the interest on the public debt.

This increased revenue, besides meeting all demands on, and leaving a large balance in the treasury, has enabled the Treasurer, in pursuance of the authority vested in him by chapter 238 of 1847; to purchase and redeem, in the course of the year, two hundred and sixty thousand one hundred and eighteen dollars and ninety-eight cents of the funded arrears of interest.

The capital of the sinking fund is now one million eight hundred and ninety thousand three hundred and eighty-seven dollars and fifty-nine cents.

Those data authorize the inference, (provided the present revenue system be undisturbed, and no additional burdens be imposed upon the treasury;) that the means which have been provided to relieve the state from her financial embarrassments, and place her in the elevated position she ever before occupied among her sister states, will be adequate not only to accomplish these paramount objects, but also, in about fifteen years, to extinguish the entire public debt.

That accomplished, the ordinary revenue, with that derived from her internal improvements, will be sufficient to defray all the ordinary expenses of the government, and will leave a handsome surplus to be applied to the purposes of education or such other objects of general interest as may be deemed worthy of state patronage.

D. CLAUDE, Treasurer, Md.

Treasury, Annapolis, 1st Dec. 1849.

Singular Accident on the Portsmouth, Saco and Portland Railroad.

We have the following particulars of the accident on the eastern route on Wednesday, from Longley and Co.'s Express. When the train was within about half a mile of N. Berwick, and going at a rapid rate, one of the wheels of the last car, belong to the Boston and Maine railroad train, which was full of passengers, suddenly broke, falling upon the track. The car was instantly thrown upon one side, and uncoupled from the remainder of the train. Every exertion was used by the conductor and others upon this train to stop the cars, and hasten to the assistance of those in the one overturned. They found that the stove had been thrown to one side, the coals scattered about, and that the inside was all in a blaze. A part of the passengers had succeeded in getting out, but the remainder were in rather a dangerous position, it being difficult, from the position of the car, to get through the doors or windows. With the assistance of the other passengers, they were all however, rescued without any having suffered serious injury, though many were badly burned, some bruised, and almost all lost cloaks, hats, muffs, or

umbrellas. Within 15 or 20 minutes after the breakage, the car was reduced to ashes. It was almost unaccountable that no lives should have been lost, either from the shock of the first overturn, or from the fire. A passenger in the train describes the scene as thrilling in the extreme. Every seat in the car was occupied, at the time of the accident, by men, women and children. From its windows proceeded volumes of smoke, and the cries and frantic attempts of those imprisoned within were quite appalling.—*Boston Traveller.*

NAUMKEAG STEAM COTTON COMPANY.

From the Treasurer's report at the annual meeting of the stockholders, held on Wednesday, we learn that the affairs of this corporation are in a most flourishing condition. The net earnings for the year past, after paying upwards of \$28,000 for interest, repairs, and new machinery, have amounted to \$82,390—not one dollar has been charged to "construction" account for the year's operations. A dividend of 4 per cent. has been declared for the past six months, and a surplus reserved fund is left, amounting to \$48,500. The last year's dividend has been 8 per cent.

The aggregate amount of goods manufactured in 1849 was 5,394,100 yards. The mills have used 3789 bales of cotton. The stock of cotton now on hand consists of 2063 bales, all of which was purchased previous to the recent advance in the price. This is expected to be sufficient to keep the mill in operation till next August.—*Salem Observer.*

Commercial.

Commerce with California.—The whole number of clearances at different ports in the United States for California, since Jan. 1, 1849, has been 707 as follows viz:

New York.....	214	Belfast, Me.....	3
Boston.....	151	Mobile.....	3
New Bedford.....	42	Newport R. I.....	2
Baltimore.....	38	Bristol.....	2
New Orleans.....	33	Holmes' Hole.....	2
Philadelphia.....	31	Saco, Me.....	2
Salem.....	23	Thomaston, Me.....	2
Bath, Me.....	19	Wilmington, N. C.....	2
Portland, Me.....	13	Stonington.....	2
Bangor.....	13	Plymouth.....	1
New London.....	17	Barnstable.....	1
Providence.....	11	Mystic, Conn.....	1
Eastport, Me.....	10	East Machias, Me.....	1
Nantucket.....	8	Frankfort.....	1
Fall River.....	7	Cherryfield.....	1
Charleston, S. C.....	7	Bridgeport, Conn.....	1
Newburyport.....	6	Newcastle, Me.....	1
Gloucester.....	6	Portsmouth, N. H.....	1
Warren, R. I.....	6	Searsport, Me.....	1
Sag Harbor.....	6	Hyannis.....	1
Norfolk.....	5	Norwich, Conn.....	1
New Haven.....	5		
Edgarton.....	4		707

Of the above clearances, 368 were from New England, and 339 from all the other States. The proportion of North and South is as 619 is to 88.

Connecticut.

Canal Railroad.—At the annual meeting of the Canal railroad company, held this morning, the following gentlemen were appointed Directors for the year ensuing: Joseph E. Sheffield, Harvey S. Hoadley, Henry Whitney, Gouveneur Morris, J. T. Gerry, William Johnson, Wm. H. Ellis, Wm. A. Larned, Russel Hotchkiss.

At a meeting of the directors, subsequently, Jos. E. Sheffield was elected President; Jas. S. Redfield Secretary; Stephen D. Pardee, Treasurer; and Henry Farnham, Superintendent.

Boston and Maine Railroad.

To the Honorable Senate and House of Representatives:

In presenting the fifteenth annual report of the Boston and Maine railroad, the directors beg leave to remark that the past year has been one of vicissitude and trial for this road, inasmuch as, in addition to fluctuations of business, occasioned by the monetary condition of the country, and by the vic-

tation of that pestilence which has traversed our land and diminished materially the public travel, conflagrations have repeatedly reached the property of the corporation, and destroyed a costly bridge at Salmon Falls, and all the extensive repair shops at Lawrence, involving the company in heavy losses, which, with the destruction previously experienced of a freight house and a large amount of merchandise at Dover, have caused an actual annihilation of property exceeding seventy thousand dollars in amount. These accumulated losses to the company, have proved a serious drawback upon its earnings, and thus curtailed the dividend.

The usual July dividend has been delayed to the end of the year by the action of the stockholders in the protracted inquiry and severe scrutiny which they caused to be instituted through their committee of investigation. The result of this examination into the company, proves the unquestionable soundness of the enterprise, and calls for renewed diligence on the part of the directors; and must give to the stockholders and the public the fullest confidence in the future prosperity of the road.

The following statement shows the business of the past year:

The reserve fund by the last annual report amounted to.....	\$48,272 45
Income for the year ending Nov. 30th from passengers.....	332,214 00
For freight.....	168,974 21
Mails, rents, and use of road.....	21,147 30
	\$570,607 96

The expenditures, properly chargeable to the operating of the road, and for depreciation of engines and cars.....

	276,199 42
	294,408 54
* From which, is to be deducted, as extraordinary charges for this year, the items for loss of Salmon Falls bridge, car shop at Lawrence, committee of investigation, and interest.....	53,491 19

A dividend has been paid on 35,568 shares of 5 1/2 per cent.....

	195,624 00
Leaving as a present reserve.....	\$45,293 35
Capital Stock.....	\$4,140,000
Increase of capital since last report.....	600,000
Capital paid in per last report.....	3,249,804 52
Capital paid in since last report, (362,305 are due and payable Jan. 1, in addition).....	466,065 00

Total amount of capital stock paid in.....

	3,715,869 52
Funded debt, per last report.....	176,000
Funded debt paid since last report.....	10,000
Funded debt, increase of, since last report.....	nothing.
Total present amount of funded debt.....	166,000 00
Floating debt, per last report.....	121,985 93
Floating debt paid since last report.....	17,949 96
Floating debt, increase of, since last report.....	nothing.
Total present amount of floating debt.....	104,035 97

Total present amount of funded and floating debt.....

	270,035 97
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Average rate of interest per annum, paid during the year.....

	5,719 per cent.
Maximum amount of debt for each month during the year, viz: January, \$250,000; February, \$246,000; March, \$243,000; April, \$305,000; May, \$373,000; June, \$350,000; July, \$377,000; August, \$347,000; September, \$420,000; October, \$385,000; November, \$322,000; December, \$270,000.	

Cost of Road and Equipments.	
For graduation and masonry, per last report..	\$821,488 57
For graduation and masonry paid during the year.....	43,335 87
Total amount expended for graduation and masonry.....	864,824 44
For wooden bridges, per last report.....	354,390 80
For wooden bridges paid during the past year...	9,206 08
Total amount expended for wooden bridges.....	363,596 88
Total amount expended for iron bridges, (if any)...	nothing.
For superstructure, including iron, pr. last report	873,052 57
For superstructure, including iron, paid during the past year.....	145,092 49
Total amount expended for superstructure, including iron.....	1,018,145 06
For stations, buildings and fixtures, per last report.	373,586 82
For stations, buildings and fixtures, paid during the past year.....	71,159 78
Total amount expended for stations, buildings and fixtures.....	444,746 60
For land, land-damages and fences per last report.....	602,071 26
Land, land-damages fences, paid during the past year.....	117,679 07
Total amount expended for land, land-damages and fences.....	719,750 33
For locomotives, per last report.....	115,540 46
For locomotives, paid during the past year.....	13,182 27
Total amount expended for locomotives.....	128,722 73
For passenger and baggage cars, pr last report	60,350 00
For passenger and baggage cars, paid during the past year.....	6,100 00
Total amount expended for passenger and baggage cars.....	66,450 00
For merchandise cars, per last report.....	108,027 80
For merchandise cars, paid during the past year....	nothing.
Total amount expended for merchandise cars.....	108,027 80
For engineering, per last report, and agencies and other expenses.....	263,323 76
For engineering paid during the past year, agencies and other expenses.	6,464 72
Total amount expended for engineering and agencies and other expenses.....	269,793 48
* This amount is obtained by ADDING interest, and DEDUCTING depreciation of engines and cars, as below, under the head of "Estimated depreciation beyond renewals," and may be stated thus:	
Amount at the foot of returns.....	\$46,179 85
Add interest, which is not strictly a running expense.....	25,016 17
	\$71,196 02
Deduct depreciation of engines and cars, which is a running expense..	17,704 83
	\$53,491 19
For agencies and other expenses, per last report.	nothing.
For agencies and other expenses, paid during the past year.....	included above.
Total amount expended for agencies and other ex-	

penses..... 3,984,057 32
Deduct 1200 tons iron not used, a \$42..... 54,000 00

Total cost of the road.....\$3,930,057 32

It may here be remarked that in the expenditures proper, for the last year, is included a considerable amount of charges, incurred in previous years which go to swell the cost of operating the road.—It has been deemed quite important by the present board to reach and liquidate every claim chargeable upon the road, and this has been successfully accomplished, with the exception of certain land damages and demands for personal injury, which were considered too exorbitant to be submitted to, but these, with the exception of the mill pond lands in this city, will not probably exceed fifty thousand dollars, while the property on hand, not required for the use of the road, which may be made available at some future time, will fully provide for these contingencies.

A careful appraisal has been made of all the stock and materials on hand for repairs, and of the wood for the use of the road, so that its position is known with a good degree of accuracy.

A considerable outlay will be required the coming year, for new depot buildings at Andover, Lawrence and North Andover, as provided for by the stockholders, and also for new engines, passenger and merchandise cars, and repair shop at Lawrence, to meet the growing demands upon the company.

The capital stock of the company being increased by the sum of \$600,000 at this time, and additional facilities being furnished to the public, it has become necessary to raise the fares to an average of about two and a half cents per mile. This increase, however, will not exceed that of most of the costly roads terminating in Boston, and will still be below that of some of them, and cannot, it is believed, be considered burdensome by a reasonable public.

New avenues of ingress and egress are extended to this road, and since the last annual report, arrangements, mutually satisfactory, have been made with the following roads for the conveyance of freight and passengers, viz:—the Great Falls and Conway, the Cocheco, the Essex, the Lowell and Lawrence, and Manchester and Lawrence railroads, already in operation, and the South Reading Branch road, about to be constructed.

Ohio.

Scioto and Hocking Valley Railroad.

We find in the Scioto Gazette a synopsis of the report of the Engineer, Mr. Webb, of this road, the material part of which we give below:

The starting point of leveling was low water mark on the Ohio—the line of measurement begins on the north line of Portsmouth. Thence, the course of the river was followed, keeping on ground not likely to overflow, to Piketon; thence, on the east side of Scioto, to Richmond; thence across the table land, to Chillicothe; thence, in a direct line, to Circleville; thence, to Lancaster; thence, near Baltimore, to Newark. Chillicothe is 158 feet above low water mark in the Ohio; Circleville, 221 feet; Dividing Ridge, between waters of Scioto and Hocking, 586 feet, and 365 feet above the town of Circleville; Lancaster is 365 feet above Ohio low water mark; and Newark, 363. The highest grades, it is perceived, are between Circleville and Lancaster.

Mr. Webb divided the whole line into four divisions, for the purpose of measurement, graduation, estimation, &c. The whole distance is 116½ miles. All the estimates are made on a scale which the engineer deems fully adequate to the completion of the line, in the most substantial manner, on the plan proposed. These include the use of the heavy T or H rail—after the necessary clearing, grubbing, excavation, &c., and the ballasting of the road one foot thick and ten feet wide, with good gravel. Cross ties 6x10 in., 8 ft. long are to be imbedded every 2½ feet; and on these the rails are to be laid and securely fastened by means of cast iron chains or chairs or spikes. The cost is counted, as follows, viz:

1st Div., 37 miles, from Portsmouth to Richmond, £387,425-85; or, \$10,471-05 per mile.

2d Div., 31 miles, from Richmond to Circleville, \$337,943-65; or, \$10,900-60 per mile. This includes two wooden bridges, 100 feet span, supported by arched trussings, abutments and piers of range stone work, well grouted, across the Scioto river.

3d Div., 32 miles, from Circleville to Baltimore, \$370,710-70; or, \$11,584-71 per mile. This includes the heaviest grading on the line.

4th Div., 16½ miles, from Baltimore to Newark, \$137,482-22; or, \$8,457-12 per mile.

To the aggregate sum, \$1,233,511-42, is added \$61,675-58, for engineering and contingencies;—making the total cost, not including depots, cars, engines, etc., \$1,141-39 per mile.

In concluding his report, the able and excellent engineer observes:

"The route generally traverses an interesting district of country, unsurpassed in the fertility of its soil in Ohio, not mountainous, but sufficiently undulated to be eminently adapted to agricultural pursuits. Its mineral resources have never been fully developed. The inexhaustible beds of iron ore and coal are alone sufficient to render your investment in the stock of this railroad a profitable one; and all this business, together with the very large amount that would naturally flow in from the east, north and south, this road would do without danger of rivalry."

Massachusetts.

Boston and Lowell Railroad.—The annual report of the Lowell Railroad gives the following as the income derived from the upper roads connecting with that company:

From the Concord, for passengers....	\$20,022 82
Nashua.....	14,853 96
Boston, Concord and Montreal.....	4,481 41
Northern.....	4,015 36
Passumpsic.....	3,496 48
Vermont Central.....	3,040 64
Concord and Claremont....	345 35
Stoney Brook.....	165 67

Total from passengers.....\$50,421 60

From the Concord, freight.....	\$34,939 71
Nashua.....	15,762 48
Northern.....	12,542 32
Passumpsic.....	11,456 14
Vermont Central.....	9,327 52
Boston, Concord and Montreal.....	7,425 46
Wilton.....	4,269 10
Stoney Brook.....	1,747 47
Concord and Claremont....	1,466 28

Total from freight.....\$98,936 48

Total from passengers and freight from upper roads.....\$149,358 17

Connecticut.

The following is about the length, respectively, of the parts of the railroads mentioned, which lie within the State of Connecticut, and which are now completed and in use:

Of the New Haven, Hartford and Springfield road.....	54 miles.
Middletown Branch.....	6
N. Haven and Northampton.....	41
N. York and N. Haven....	47
Naugatuck.....	62
Housatonic.....	74
Norwich and Worcester....	53
Stonington.....	4
N. London, Willimantic and Palmer.....	46
Hartford and Willimantic..	44

Total miles in use, within the State.....431

The total length of all these roads, when completed, will be, within and without the State, some 730 miles; but the portion now completed and in use, within the State limits, is, as given above, about 431 miles.

Maine.

Portland and Montreal Railroad.—The receipts from passengers for December, 1849, were \$6,075 92. The freight receipts are not yet fully made out.

The following table exhibits the amount of receipts from passengers and freight respectively for each month in the year, excepting the freight receipts for December:

	Passengers.	Freight.
January.....	\$3,437 11	\$1,931 98
February.....	3,469 89	2,915 04
March.....	5,238 37	4,138 94
April.....	4,274 11	3,000 72
May.....	3,951 13	3,093 64
June.....	4,665 65	5,182 59
July.....	6,763 18	2,021 58
August.....	7,517 55	2,714 97
September....	7,317 76	2,725 43
October.....	7,525 22	4,696 86
November.....	6,657 35	4,848 22
December.....	6,075 92	

Total.....\$66,893 24 \$37,269 97

Making 104,163 21, as the total receipts of the road for the year 1849, exclusive of the freight receipts for December.—*Advertiser.*

Connecticut River Railroad.—The annual meeting of the stockholders of the Connecticut River railroad company was held in Boston on the 16th inst. The following gentlemen were chosen Directors of the company for the present year, viz: Samuel Henshaw, James K. Mills, Lemuel Pope, N. H. Emmons, Ignatius Sargent, and Graham Brooks, all of Boston; Erastus Hopkins, of Northampton, H. W. Clapp of Greenfield, and J. S. Morgan of Hartford; all being members of the old Board, with the exception of Mr. Brooks, chosen in the place of Dr. E. H. Robbins, deceased.

A dividend of 3 per cent is to be paid to the stockholders on the 1st of February.

—Of the gross receipts of this road for the year 49, \$192,072, \$106,261 were from passengers, \$79,648 from merchandise, \$3,823 from mails, and \$1,250 from the express. The aggregate receipts of the several quarters were as follows: 1st, \$32,331; 2d, \$49,434; 3d, 59,304; 4th, \$50,082. The total expenses of the year, were 95,090, which leaves a net income of \$96,982, or more than the total expenses.

Of the expenses, \$31,923 was incurred in the transportation department; \$16,489 at stations; \$13,948 in repairs on road, 747 ditto on bridges; \$1,362 ditto buildings; \$10,045 ditto engines; \$6,220 passenger cars, \$3,037 ditto freight cars; \$525 for clearing snow; \$1,161 for stationery, printing and advertising; and \$524 for damages. The wood used during the year cost \$16,383; the oil \$2,231.

North Carolina.

Wilmington and Manchester Railroad.—One Hundred Thousand Dollars.—On the 4th instant, General W. W. Harlee, the President of the Wilmington and Manchester railroad company, arrived here, and announced to our citizens, that unless one hundred thousand dollars additional subscription for the stock of the company could be made at once, he feared that operations on the line would have to be suspended, and moreover, that the chances for a re-commencement of the work were doubtful. Here then was presented the great crisis of the enterprise. It was met by our people in a bold, manly, and decisive manner. Meeting after meeting was held, and speech after speech was made, several by General Harlee himself, distinguished by all the intelligence of his mind and all the fervor of his feelings; active and influential citizens carried around subscription lists, public-spirited men of ability came forward and increased the amount of stock already taken by them, and new names were added to the subscription papers; in short, one grand, united effort was made, and by the night of the 10th inst., the required one hundred thousand

dollars had been made up, showing an aggregate of two hundred and eighty thousand dollars subscribed in Wilmington and its vicinity, nearly all in town, to the capital stock of the Manchester road. Enough of its stock has now been taken, [namely, \$750,000,] to entitle the corporation to claim the additional subscription of the state of South Carolina, amounting to \$200,000.

We do not see any very serious obstacle in the way of the success of the company in building the road, and that with all practical dispatch.—*Wilmington Chron.*

Indiana.

Evansville and Princeton Railroad.—The annual election for directors of this road, was held at the Court House on Monday. All the old directors were re-elected, with the exception of two, whose places were filled by Messrs. Willard Carpenter and Nathan Rowley. The board of directors is now composed of the following gentlemen: Sam'l Hall, Willard Carpenter, John Hewson, John S. Hopkins, James Lockhart, James G. Jones, Nathan Rowley, Sam'l Orr and John Ingle, Jr.

Samuel Hall, Esq., is President of the company, and Wm. Rowley, chief engineer.

We see by the Evansville Journal that the company have advertised for proposals for grading and bridging the road from Evansville to Princeton, a distance of 26½ miles. The time for receiving the same will expire February 20, 1850.

Georgia.

Memphis Branch railroad.—The profits of the Memphis branch railroad for the year ending January 1st are, we are pleased to learn, 114 per cent. A dividend of 8 per cent. has been declared in favor of the stockholders.

Kentucky

Mr L. L. Robinson, appointed by a meeting of the citizens of Maysville, to examine the route for the proposed railroad between Maysville and Lexington, has made a report. He has examined two routes, both of which he says are entirely practicable. He says: "I am more firmly than ever convinced, (after travelling through the counties to be traversed by the road,) that the road when completed, will be one of the best dividend paying stocks in the West."—*Commonwealth.*

Pennsylvania.

Schuylkill Navigation Company.—We have received the annual report of the President and managers of the Schuylkill Navigation Company. The following are the officers of this company for the ensuing year:

Frederick Fraley, President.

Managers—John R. Worrell, Eli K. Price, Geo. W. Carpenter, Joseph H. Seal, Joshua Lippincott, Nathaniel Lewis Paleske, Philip R. Howard, Benjamin Gerhard, Thomas T. Lea, Richard D. Wood, Charles H. Rogers, Geo. H. Thompson.

Charles W. Bacon, Treasurer and Secretary.

Memphis and Charleston Railroad.

The south seems quite in earnest in the matter of railroads. Already the Memphis and Charleston road, which was in only conception some few weeks ago, is beginning to assume the shape of a reality, and will, by a continuance of the spirit that has sustained it to the present time, be soon a matter of earth and iron. We observe by the Huntsville Dem. that the charter awaits the signature of the Governor of Alabama; and that the bill authorising the corporation of Huntsville to subscribe to the amount of \$100,000 in stock will be passed without opposition. The Legislatures of Tennessee and Mississippi are still to take action in the case of this most important work. By private advices received some short time since from William B. Miller, Esq., a gentleman very much

interested in the road, we are lead to look on the organization of this work as a certainty near at hand. God speed the good cause! Go on, gentlemen of the south: railroads are at once the measure and the agents of progress.

Massachusetts.

Damages.—John B. Patch has recovered of the Vermont and Mass. railroad co., \$2,500 damages received in 1847, by the breaking down of a bridge at Athol, over Miller's River.

Georgia.

Muscogee Railroad.—On the 7th instant, the following gentlemen were re-elected Directors of the Muscogee railroad: Maj. John H. Howard, Maj. R. S. Hardaway, Dr. R. A. Ware, Gen. S. A. Bailey, Hon. R. B. Alexander, H. Hall, Esq., and Col. J. Wimberly.

Macon and Western Railroad.—The annual meeting of the stockholders of this company took place at their office, in this city, on Tuesday last, when the reports of the President, Isaac Scott, Esq., and the superintendent, Mr. Foote, were presented and read. The reports of these officers indicate a high state of financial prosperity, and prove that the affairs of the company have been most ably managed. From these reports it appears the income of the road for the year ending on January 1, amounted to \$198,467 93; the expenses to \$87,698 67—leaving net earnings, \$110,769 26. Of the earnings, 112,270 88 were for freights, \$74,808 59 for passengers, and 10,100 for mail service. The whole number of passengers who travelled upon this road during the year, is put down at 35,517, and the distance run by all the engineers of the company, in the same time, was 149,184 miles.—*Macon Messenger.*

New Hampshire.

Cocheco Railroad.—At a meeting of the Stockholders of the Cocheco railroad, at Dover, last week, it was voted to extend the road to Alton Bay, and to extend the stock to \$600,000 for that purpose. During the two months the road has been in operation, it has done much better than was expected by its friends. Its cost was \$374,833, of which \$200,885 were received from subscriptions, and \$4,000 from bonds, leaving \$148,314 of debt, of which \$52,314 are due to the company on unpaid subscriptions.—*Boston. Cour.*

ROADS AND RAILROADS.

BY W. M. GILLESPIE, A.M., C.E.

The Engineering profession, above all others, is that on which the progress of this country depends; and as our capital falls short of the rich resources which present themselves for development on every side, the husbanding of the national capital is so strong a necessity with us that, with a view to that end, we cheer on gladly all who endeavor to raise the Engineering profession to its true standard of science and practise. Science and observation are evidently necessary to the proper economy in mechanical construction: if an Engineer content himself within the narrow limit of his own experience he might as well have lived before the days of Rennie. "What has been done?" should be the question of every spare moment of an Engineer; and in the absence of an answer in strict conformity with a particular case, the only light to guide him is the light of science. A false step in an engineering work may cost thousands of dollars;—and therefore do we repeat emphatically that an Engineer must be not merely a working, but a reading man—a man read in principles and practice. We have been led into these remarks by the perusal of Mr. Gillespie's book on roads—a work of which we are glad to say the 3d edition has been just issued by A. S. Barnes & Co., of this city.

Mr Gillespie's book discusses the location, construction, etc., etc., of all kinds of roads: while sufficiently scientific to be economic, it is also sufficiently popular to be plain. Mr. Gillespie seems exactly of the class of men we wish to see in the profession: men who make their science subserve to practice, and make both subserve to an enlightened economy. He states in his very interesting work a number of select facts, highly useful to the Engineer; and combines them with great point and clearness in practical applications. Every Engineer is bound to sustain such exertions to disseminate true Engineering knowledge; and we too, in our vocation, are bound to cheer on Mr. Gillespie, and all our brethren who, by placing like him the result of their study and practise on record, widen the limits of our professional knowledge, and thereby help, by husbanding the national capital, to the quicker progress of our common country.

AMERICAN RAILROAD JOURNAL.

Saturday, January 26, 1850.

Railway Damages.

We believe that there are municipal regulations prevailing in many of our cities, empowering the authorities to assess, in laying out new streets, a sum, in the shape of a tax, equal to the increased value of the real estate, consequent upon such laying out, as well as to allow damages to such as may be injured by the same process.

This is a rule of plain common sense, as well as justice, and creates no complaint from those affected by it. Public convenience demands the opening of a new way, and as the public, in its organized capacity, must execute this work, and must make proper compensation for individual injuries sustained, nothing can be more just, than that those who are individually benefited by it over and above the general convenience enjoyed by them in common with the public, should contribute something of this individual benefit, to make up the injury sustained by others, and which the public must make good. Now in principle there is no difference between a railway and a common highway. Both have the same end; and as railways are vastly better adapted to secure this end than the ordinary road; the former, for almost all purposes, will supersede the latter, as fast as they can be constructed. The relative influence of these two kinds of highways, in increasing the value of property affected by their construction, is at least in proportion to the superiority of the railway over the common roads, and we can see no reason whatever, why the same rule should not prevail in regard to damages arising from the construction of a railroad as is now observed and sanctioned by common consent, in the laying out of public highways in cities and towns.

Very few railways are built in this country, as a matter of investment of money. An agricultural section, for instance, feels the need of a railway for the purpose of sending its produce to a market. The return to be received in the shape of dividends for its cost, is but a secondary consideration with those who build it. The farmer who contributes five hundred dollars towards the project expects that it will be the means of increasing the value of his farm to twice that sum. The merchants aid it in the anticipation of the increase of business it will give them. The whole community expect to share equally in its benefits, and this community of interest is the reason why towns and counties, as well as States, lend their aid, in their corporate capaci-

ties, to such works, where there may not be sufficient individual strength for their construction.

Now where a whole community is engaged in the construction of a railroad, why should it pay an individual member a thousand dollars for injury sustained by running through his land, when the road itself may quadruple its value? It should not. The right to take, for a proper consideration, one person's land for the benefit of the public is incident to the sovereignty of every State, but where the same act that takes his land betters his condition, such person certainly has no claim upon the community for an act required by the public good.

We hold that in no case whatever should a man be assessed for the benefits received by the construction of railways. If he is benefited, that is his good fortune. If he claims damages, only the balance of injury over benefit received should be allowed him. Such regulation would protect individual rights, and at the same time relieve the public of paying exorbitant sums in the shape of damages to those who are vastly benefitted by the very act of which they complain.

It may be argued that in laying out streets in cities, the land in such cases is taken by the public, but that a railway represents private individuals, and consequently that the parallel does not hold good. But railways are public works, and are recognised as such by the very authority given them to take private property necessary to their construction. The law directs that those suffering injury in consequence shall be paid to the amount of such injury. The public and not the stockholders are the gainers, just in proportion to the cheapness of the road, as rates of charges are graduated in proportion to its cost.

We hope that this subject will receive general attention, and that efforts will be made to secure the passage of such laws as will extend a well-known and acquiesced-in principle to the construction of railroads. We feel satisfied of its justice, and we are equally satisfied the novelty of its application will be found to be the great objection to its adoption. Proper care should of course be taken that private rights are properly guarded, while at the same time the interest of the many are equally well protected against individual cupidity.

Maine.

Buckfield Branch Railroad.

We have often had occasion to speak of the progress of railways in Maine, under the influences which have there been actively at work for the last five years. Over one hundred miles of new road have been opened the past year, and her great lines extending west, north and south are all in progress at the present time. The road to Montreal is to be completed in three years; the York and Cumberland railroad seems likely to be finished in much less time, and the road from Portland to Augusta is now advancing at several points on the line from Brunswick to Augusta, and from North Yarmouth to Portland; and a large and enthusiastic meeting at Bangor has been held the present week to take measures to extend the railway from Waterville to Bangor. There is also the Androscoggin railroad, from Greene to Jay, in rapid progress, which promises to be the cheapest road in New England.

Among the various enterprises which have been successfully accomplished within the last few years we know of no one which, under like circumstances, has done more to advance the cause of railways, to raise the character of the State abroad, or that gives more sincere pleasure by its construc-

tion, among its own people at home. It is a work that reflects credit upon all the parties engaged in it, and demonstrates, to the satisfaction of the most skeptical, the fact, that railways can be successfully undertaken by people of the interior of the country, and finished at far less expense than has been generally supposed.

Some three years ago, the people in the town of Buckfield embarked in the plan of constructing a branch railroad from some convenient point on the line of the Atlantic and St. Lawrence railroad to the village of Buckfield, a thriving little manufacturing place, in the midst of a good agricultural district, the town itself, however, containing less than 2,000 people. The surrounding towns, whose population naturally came to this point on their way to market, embraced some 6,000 to 8,000 people, all of whom united in the work of constructing this 13 miles of railway on the gauge of 5 ft. 6 in. in union with that of the Atlantic and St. Lawrence railroad, mainly for the purpose of giving themselves greater facilities for business and for their own accommodation. A favorable line for a railroad was found, from the village of Mechanic Falls, in Minot, and the people subscribed at once an amount of stock sufficient to grade and equip the road, furnish station houses, &c., and placed the whole line under contract, trusting to their credit for the means to pay for the iron rails. The work was placed under contract in October, 1848. The grading was principally finished in the course of twelve months, notwithstanding the severe money pressure during the whole period, and the means were entirely raised along the line of the road; many of the stockholders paying into the contractors labor and materials which was in that way made available towards their assessments.—The whole cost of grading the road and fitting it for the superstructure was less than *four thousand dollars* per mile, including engineering and all other expenses.

The charge of the work was committed to A. T. Arrowsmith, Esq., as Chief Engineer. The contractors were Messrs. Benson & Porter, though the management of the work was conducted by Mr. Benson.

The management of the affairs of the company devolved principally on the Hon. VIRGIL D. PARRIS, President of the corporation, to whose industry, prudent management, and good judgment the company is largely, if not mainly, indebted for its success. He contracted with Messrs. Wainwright & Tappan, of Boston, for the iron in January, 1849, at \$42 50 per ton, free on the wharf at Portland. The rail used is the approved form of the bridge pattern, weighing 50 lbs. to the lineal yard.

Hon. F. O. J. SMITH, who is so well known in the telegraph, advanced the money for the iron, taking the bonds of the company secured by a mortgage on the road. The rails were laid during the fall of 1849, and on the 15th of the present month the road was open for travel. In passing over the line on this occasion, I was struck with the substantial appearance of the work, and the spacious depots at West Minot, and at the terminus of the road at Buckfield. The material is generally a fine gravel abounding upon the line of the road. The road-bed is principally an embankment, raised from 2 to 3 feet above the ordinary level of the country, which seems to keep the track clear of obstruction by reason of the snow and ice.

The whole work has been done at an expense less than \$9,000 per mile, and will not exceed \$10,000 or

\$11,000 per mile with a fair equipment. The means have all been furnished as required by the people of Buckfield and the towns adjacent, except the money for the iron.

Similar exertions in other parts of Maine, will give railroad facilities to every portion of that great State. We cannot omit the opportunity to express, not only our satisfaction, but our admiration of the effort that has achieved so noble a work. The low cost of the road and the cheapness of building it, will aid towards making it a good paying stock, while it confers upon the people of this hitherto excluded region, the inestimable blessings which the railway scatters along its path.

At the opening of the road, the most lively demonstrations of satisfaction were exhibited at Buckfield. Speeches were made on the occasion, by the President of the company, Mr. Parris, the Hon. Judge Preble, Hon. John Anderson, R. A. L. Codman, Esq., and John A. Poor, Esq., of Portland.

We cannot fail to congratulate the stockholders and friends of the enterprise upon this auspicious result. They will be richly repaid for their noble exertions in the enhanced value of all their lands and other property, and in the increased accommodation which each one will thereby enjoy.

Railway Progress.

At the commencement of the past year, we gave a detailed statement of the extent of railroads in the United States already constructed, with an enumeration of those in progress. We now give a similar table with such corrections and additions as our greater means of information and the progress of railways have enabled us to make.

In our present number are embraced the railroads of New England. The whole number of miles in operation the 1st day of January, 1850, were 2,300½.

The whole extent of railway opened in the above States the past year is 605½ miles.

The whole amount expended upon the above works, together with those now in progress, but not yet opened, cannot be less than \$100,000,000.

The above will give some idea of the extent to which these works have been pushed in this section of the country.

MAINE.

Roads in Operation January 1, 1849.

Calais and Baring.....	3 miles.
Machiasport.....	8
Bangor and Piscataquis (to Oldtown).....	11½
Portland, Portsmouth and Saco.....	51
Boston and Maine.....	2
Atlantic and St. Lawrence.....	28
Androscoggin and Kennebec.....	6½
	110½

Opened in 1849.

Androscoggin and Kennebec.....	48½
Atlantic and St. Lawrence.....	19
Portland and Kennebec.....	25
Bath Branch.....	9
Opened in 1849.....	101½

Total.....211½ mls.

Roads in Progress.

Buckfield Branch (13 miles opened January 17, 1850.)	
Atlantic and St. Lawrence.	
Portland and Kennebec.	
York and Cumberland.	
Calais and Baring.	
Androscoggin.	

NEW HAMPSHIRE.

In Operation January 1, 1849.

Eastern.....	16 miles.
Nashua and Lowell (9½ miles in Mass.).....	5½
Concord.....	34
Boston and Maine.....	35½
Great Falls Branch.....	2½
Northern.....	69
Cheshire (54 in all).....	43
Boston, Concord and Montreal.....	36
Bristol.....	13
Nashua and Worcester.....	7
	261½

Opened in 1849.

Sullivan.....	25½
Boston, Concord and Montreal.....	9
Concord and Claremont.....	18
Portsmouth and Concord.....	18
Cochecho.....	18
Manchester and Lawrence.....	25
Great Falls and Conway.....	9
Wilton.....	8
	132½

Total.....394½ mls.

Roads in Progress.

Boston, Concord and Montreal.	
Cochecho.	
Great Falls and Conway.	
Contoocook Valley.	
Ashuelot.	
New Hampshire Central.	
Portsmouth and Concord.	
Concord and Claremont.	

VERMONT.

Roads in Operation January 1, 1849.

Vermont Central.....	52 miles.
Connecticut and Passumpsic.....	40
	92 miles.

Opened in 1849.

Vermont Central.....	65
Rutland.....	119
Connecticut River.....	10
	194

Total.....286 miles.

Roads in Progress.

Connecticut and Passumpsic.	
Whitehall and Rutland.	
Vermont and Canada.	

MASSACHUSETTS.

Roads in Operation January 1, 1849.

Berkshire.....	25 miles.
Boston and Lowell.....	26
Woburn Branch.....	2
Boston and Maine.....	36
Boston and Providence (43 in all).....	38
Stoughton Branch.....	4
Dedham Branch.....	2
Boston and Worcester.....	45
Millbury Branch.....	4½
Saxonville Branch.....	4
Milford Branch.....	12
Cheshire.....	11
Connecticut River.....	50
Chicopee Branch.....	2
Dorchester and Milton Branch.....	3
Eastern.....	38
Marblehead Branch.....	4
Gloucester.....	14
Salisbury.....	3½

Fall River.....	42
Fitchburg.....	50
Hartford and New Haven.....	6
Lexington and West Cambridge.....	6½
Nashua and Lowell.....	9½
New Bedford and Taunton.....	20
Norwich and Worcester (66 in all).....	17
Old Colony.....	37½
Pittsfield and North Adams.....	20
Providence and Worcester.....	25½
Taunton.....	11
Vermont and Massachusetts (69 in all).....	49
Western.....	117
West Stockbridge.....	2½
Cape Cod Branch.....	27½
Peterboro and Shirley.....	12
Essex.....	21½
Stoney Brook.....	13
South Shore.....	11½
Nashua and Worcester.....	38
Lowell and Andover.....	13
Medford Branch.....	5½
Newton Falls Branch.....	3
Brookline Branch.....	1½
Bridgewater Branch.....	7½
	893½

Opened in 1849.

Vermont and Massachusetts.....	10
Norfolk County.....	25
Harvard Branch.....	2
	330½

Roads in Progress.

Grand Junction.	
Fitchburgh and Worcester.	

RHODE ISLAND.

In Operation January 1, 1849.

Providence and Stonington (50 miles).....	45 miles.
Providence and Worcester.....	17½
Boston and Providence.....	5
	67½

Opened during 1849.....none.

In Progress.

Providence and Hartford.	
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CONNECTICUT.

Roads in Operation January 1, 1849.

New York and New Haven.....	48 miles.
Norwich and Worcester.....	59
Housatonic.....	74
New Haven Canal.....	28
Hartford and New Haven.....	56
	259

Opened in 1849.

Naugatuck.....	62 miles.
New London and Willimantic.....	28
Hartford and Willimantic.....	28
Hartford and Fishkill.....	18
New Haven Canal.....	14½
	150½

Total miles in operation Jan. 1, 1850...409½

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He is aware that this is rather a bold assertion for him to make, yet he can say with confidence that they have but to be tried to give them precedence over all others.

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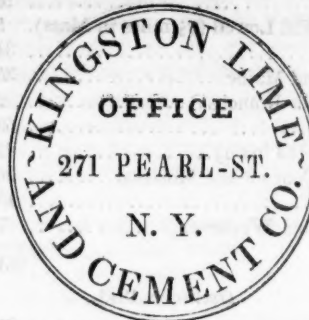
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January 19, 1850. ly

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FOR the benefit of those who have requested information in regard to this excellent article, we insert the following testimonials in relation to its merits: "In answer to the numerous inquiries in relation to J. Ball & Co's Indestructible Water pipe, composed of iron and cement and in use in our village, the undersigned, water commissioners, trustees, and late trustees of the village of Saratoga Springs, take this method of saying that we have perfect confidence in the utility, goodness and durability of said pipe. The village of Saratoga Springs has some 20,000 feet of this pipe, varying from 6; to 1 1/2 in. in diameter, under a head of about 80 feet. It has been laid since the fall of 1846. Since it was fully completed, it has cost comparatively nothing to keep it in repair; and, although some portions are exposed to the frost, it seems to stand well the test, and answer all the purposes for which it was designed and constructed. We believe it preferable to iron pipe—is much cheaper and more durable, and we would not exchange it for any other kind of pipe yet invented, if we could without any additional expense or inconvenience. The water comes through clear and pure, and where we have had occasion to take any part of it up to improve or alter the grounds, it appeared to be just as sound and imperishable as the moment it was laid down. This testimony is entirely disinterested, and is now given to avoid the necessity of answering the many calls upon us for information on this subject. We have witnessed and many of us have superintended the laying down of the pipe in this village, and watched its operations since, and are perfectly satisfied that we have the best water pipe ever presented to the public. Saratoga Springs, Dec., '49.

G. M. Davidson,	} Water Com.
R. Putnam,	
N. B. Doe,	
R. Gardner,	} Trustees.
H. P. Hyde,	
J. L. Perry,	
J. D. Briggs,	} Late Trustees.
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W. S. Alger,	
Wm. Cook,	

"I certify that I was Chief Engineer, having the construction of the above work in charge, and fully concur in the foregoing statement. Dec., 1849.

"S. R. OSTRANDER, Civil Engineer."
A card, signed by the Trustees or Water Commissioners of Saratoga Spa (village), expressing their unqualified approval of J. Ball & Co's indestructible water pipe, has been shown me; whilst I fully endorse from my own experience, the statements of these gen-

tleman, I am enabled to add that under my direction, some six thousand feet of cement pipe was laid by Messrs. Ball & Co., in this village, that the main pipe was of 10, 4 and 6 inches bore, and is subjected to a pressure due to an average head of sixty-five feet—it has fully answered my expectations. I would further state that, having been employed by the Common Council of Albany to report a plan of supplying that city with water, I had occasion very carefully to test the merits of this kind of pipe, and was so fully convinced of the practicability of using the cement pipe for large conduits, being of three feet in diameter, as well as for smaller ones, that I recommended its adoption in the proposed work, and give my reasons for so doing.

1st. That the cement pipe is far less expensive than that of cast iron or brick.

2d. That it will sustain an equal pressure with that of cast iron; and when used for large conduits, can be carried up and down the inequalities of the surface of the ground, saving the grading, which is indispensable if a brick one is used.

3d. That it can be readily and economically repaired, and, should it become necessary, can be taken up and relaid without injuring the pipe.

4th. That this description of pipe is not so much affected by frost as one of metal, and in no way impairs the quality of the water. F. S. CLAXTON,

Engineer and Ag't Cohoes Co.

Messrs. J. Ball & Co., New York.

Cohoes, December 31, 1849.

In addition to the above testimonials, we can state that, having had experience and personal knowledge in regard to the excellent qualities and durability of the above pipe, we have no hesitation in recommending it to the public.

Starr & Alburts, 122 Nassau st.

Frederick Marquand, per H. G. M., Atty.

Janes, Beebe & Co.

H. W. Metcalf, 63 and 65 Centre st.

Norman White, 111 Fulton st.

John J. Merritt, No. 76 Columbia st. Brooklyn.

Platt & Brother, 20 Maiden Lane.

Geo. Griswold, South st.

J. & J. W. Meeks, 14, 16 and 18 Vesey st.

Wm. Gale, 116 Fulton st.

J. C. Brown, Builder, 10 Dutch st.

Wm. Colgate & Co.

Thos. C. Smith.

O. R. Burnham, 17 and 19 Broadway.

G. B. Hartson, 58 and 60 Vesey st.

Wm. W. Campbell, 77 St. Mark's Place.

Lorin Brooks, 240 Broadway.

Messrs. J. Ball & Co.:

Gents.: Articles have appeared in the Farmer and Mechanic, from Saratoga and Cohoes, on the subject of your water pipes; I fully endorse their opinions. Your work for my son's water cure at South Orange, embracing a large amount of four and three inch pipe, under a head at least as great as the Croton of New York, shows not only certainty and efficiency, but what is equally important, perfect purity, which for medical purposes is all important, and should be considered so for drinking and other uses.

Yours, SAML. MEEKER.

Newark, January 11, 1850.

In addition to the above, we certify that J. Ball & Co. have inserted pipes for us of 10 inch bore and less, since the winter of 1844, and that last Spring we had over 1000 lbs. of lead pipe removed, and its place supplied with their pipe. We fully endorse the opinions expressed in the notices above.

BEACH, BROTHERS,

New York Sun Establishment.

Having for the past three years laid many of Messrs J. Ball & Co's patent cement pipes in the Newark Aqueduct Co., I prefer them to any pipe that I have used, their cost being one-third less than iron pipe, and also being free from wear and rust, and can most cordially recommend them for all aqueduct purposes.

SHELDON SMITH, Superintendent.

Newark, January 14, 1850.

THE NEWCASTLE MANUFACTURING Co. continue to furnish at the Works, situated in the town of Newcastle, Del., Locomotive and other steam engines, Jack Screws, Wrought Iron Work and Brass and Iron Castings, of all kinds connected with Steamboats, Railroads, etc.; Mill Gearing of every description; Cast Wheels (chilled) of any pattern and size, with Axles fitted, also with wrought tires, Springs, Boxes and bolts for Cars; Driving and other wheels for Locomotives.

The works being on an extensive scale, all orders will be executed with promptness and despatch. Communications addressed to Mr. William H. Dobbs, Superintendent, will meet with immediate attention.

ANDREW C. GRAY,

President of the Newcastle Manuf. Co.

LIST NO. 1, [To be Continued.]

Engineering, Railways, Machinery, Steam Engines, etc.

JOHN WILEY, 161 BROADWAY NEW YORK, has on hand and for sale the following Works on the above subjects:

SCOTT, (D.) The Engineer and Machinists' Assistant, being a Series of Plans, Sections and Elevations of Steam Engines, Spinning Machines, Mills for Grinding Tools, etc., taken from Machinists of approved construction at present in operation, 2 volumes folio, one of letter press, the other plates, half bound in Russia, \$18 00.

TREDGOLD, (T.) The Steam Engine, its Invention and Progressive Improvement, an Investigation of its Principles and its Application to Navigation, Manufactures and Railways, a new and revised edition with considerable additions, including enlarged Examples of Locomotive Engines for Railways, Marine Engines for Sea, River and Canal service, with the Construction of Steam Vessels, Stationary Engines employed for all kinds of Manufacturing purposes, Engines employed in Mines for Raising Water, or for supplying Towns with Water, Cornish Pumping Engine, Engines for Mill Work, Flour Mills, etc., High Pressure and Non-condensing Engines, issued Monthly, 15 parts are published at 75 cents each.

BUCHANAN, (R.) Practical Essays on Mill Work and other Machinery, 70 plates, 2 vols \$14 00. Supplement to do., 1 vol., 5 00.

BRIDGES. The Theory, Practice and Architecture of Bridges of Stone, Iron, Timber and Wire, 3 vols. royal, 8mo, half Morocco, 138 Engravings and 92 Wood cuts, \$25 00.

DUGGAN, (G.) Specimens of the Stone, Iron and Wood Bridges, Viaducts, Tunnels, Culverts, etc., of the United States Railroads, part 1 now ready, to be completed in about twelve monthly parts at 75 cents each.

FAIRBAIRN, (W.) The Conway and Britannia Tubular Bridges, together with an Experimental Investigation on Hollow Beams Constructed of Wrought Iron, illustrated with numerous engravings, 1 vol. royal 8vo, \$11 50.

AMERICAN LOCOMOTIVES, being a Treatise on the Theory of Steam, and its Application to Locomotive Engines, illustrated by 42 Elegant and Accurate Engravings of the most approved American Locomotives, and accompanied by full and clear explanations, designed for the use of Students, Builders and Working Engineers, by Emil Renter. The work will be completed in 16 monthly numbers, 5 numbers are now published, at 75 cts. each number. For sale by

JOHN WILEY,
Publisher and Importer,
161 Broadway, New York.

Ballard's Improved JACK-SCREW.

PATENTED.

THE ADVANTAGES OF THIS Screw for Stone Quarries, Railroads, Steam Boiler Builders, and for other purposes are superior to any other similar machine.

The improvement consists in being able to use either end of the screw, as occasion requires.

It is capable of raising the heaviest Locomotive with ease, being portable, strong and powerful, and not likely to get out of order.

Many Railroad Companies and Boiler Makers have them in use—by whom they are highly recommended.

JACK SCREWS, of various sizes, power and price, constantly on hand at the manufactory.

No. 7 Eldridge Street,
near Division Street.
New York, Jan. 19, 1850.

**To Inventors and Patentees.**

OWEN G. WARREN, ARCHITECT, Has had many years' experience as Agent for obtaining Patents, both in this country and Europe, and will transact such business promptly and reasonably. Persons at a distance can have their business done by correspondence—without the necessity of visiting this city or Washington. Office No. 94 Merchants Exchange, Wall st., corner of Hanover st., upstairs. 1y3

Great American Mechanical Work.

SUPPLIED TO SUBSCRIBERS ONLY.
PUBLISHING MONTHLY IN PARTS AT 75cts.

PART I, MEDIUM FOLIO OF SPECIMENS OF THE STONE, IRON, AND WOOD BRIDGES, VIADUCTS, TUNNELS, CULVERTS, &c., of the United States Railroads, illustrated by a Series of Drawings, from actual measurement of the works, including Plans, Elevations, Sections and details of each Structure, accompanied by remarks on the relative merits of the various forms of construction adopted, as regards economy, strength and durability, with Specifications, Estimates, Bills of Timber, Iron, etc., or the several structures: and an APPENDIX, illustrative of the art of Bridge Building as at present practised in Europe; and numerous original Designs for Bridges, Viaducts, Culverts, etc.; the whole calculated to meet the exigencies of Engineers, and assist Draftsmen, Bridge Builders, Mechanics and Students.

BY **GEORGE DUGGAN**,
ARCHITECT AND CIVIL ENGINEER.

New York: D. Appleton & Co.; John Wiley; Geo. P. Putnam; and Stringer & Townsend. Boston: Charles C. Little and James Brown. Albany: Little & Co. Philadelphia: George S. Appleton; Grigg, Elliott & Co., and Thomas Cowperthwait. Buffalo: G. H. Derby & Co. Baltimore: Cushing & Brother. Washington: Frank Taylor. Charleston: McCarter & Allen. Cincinnati: H. W. Derby & Co., and Bradley & Anthony. Richmond: A. Morris. Nashville: W. T. Berry & Co. New Orleans: T. L. White and David Felt & Co. St. Louis: J. Halsall. Natchez: W. H. Fox.

ADDRESS.

The want of a work such as the present is designed to be, has long been felt and regretted by the Engineering profession generally, but more especially by those engaged in Railroad constructions; where the number and variety of bridges are such as to make the mode of construction adopted of especial importance to all parties interested in such undertakings whether the mechanical skill, durability, or economy of these structures is considered. As regards the present undertaking, no pains or expense shall be spared to render it complete and efficient to the fullest extent for the various purposes of the Engineer, practical Bridge Builder, and Mechanical Student.

As an extensive circulation alone can meet the heavy expenses incurred in getting up this work, it is hoped that the members of the Engineering profession generally—for whose advantage it is especially designed—will extend to it the encouragement and support so necessary to its access and completion, in a manner that shall reflect credit on the spirit of enterprise, at present so rife in this great country, and also bear testimony to the mechanical skill and ingenuity of our Engineers.

MODE OF PUBLICATION, TERMS, ETC.

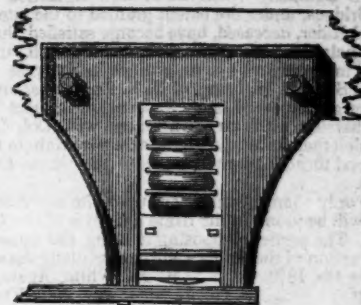
The First or American Division of this important work will be completed in about Twelve Parts, and the APPENDIX in about Eight Parts, each part containing Two double or Four single large folio plates, accompanied by appropriate letter press descriptions, Specifications, Estimates of the cost, Bills of Timber, Iron, &c. of each structure, presenting at a glance the comparative merits, as regards economy, strength, and durability of the various modes of Bridge construction at present practised by the most eminent Engineers in the United States.

The Engraving has been entrusted to first rate artists, and is executing in a manner that cannot fail to give satisfaction, while the price (Seventy-five cents a Month) is such as will place it within the reach of all who take an interest in our great mechanical contrivances.

It shall be optional with Subscribers to take the FIRST DIVISION of the work only, but the APPENDIX cannot be supplied to those who do not subscribe for the FIRST DIVISION.

N. B.—Members of the profession, and others wishing to become subscribers, are requested to send their names without delay to the author, as below, as the publication of the names of Subscribers in one of the early Parts has been determined on, and no more copies of the work will be printed than are found necessary to supply Subscribers. Parties remitting \$9, the cost of First or American Division of the work, shall receive it monthly as published, POST FREE, in any part of the United States.

Engineers in charge of Railroad Works, are respectfully requested to send Tracings of their Drawings of Bridges, &c., with the Specifications, Bills of Timber, Iron, &c., to **GEORGE DUGGAN** at his residence No. 179 Henry Street, New York, with a view to their insertion in this work. The Drawings should not, however, exceed 17 x 10, or 21 x 17 inches.

FULLER'S PATENT INDIA RUBBER SPRING.

THESE SPRINGS ARE THE CHEAPEST, the lightest and most durable of any yet known. They are easily applied to new or old cars, and there is small possibility of any accident occurring to them.

Other parties through Mr. Ray set up claims to an India Rubber Spring which, though the same in principle, is very inferior in its working and durability. Actions are in progress for an Infringement on Fuller's Patent against parties using that Spring.

The superiority of Fuller's Spring over that claimed by Mr. Ray is fully established and has frequently been testified to. The following are from gentlemen who have had much experience with both Springs.

"It will afford me pleasure to recommend your springs to the companies in this region, in preference to Ray's which I am confident are inferior in mechanical arrangement to yours."
JOHN M'RAE,
Engineer S. Carolina R. R., Charleston.

"I do not hesitate to allow you to say that I concur in Mr. M'RAE's opinion that Ray's springs are inferior in mechanical arrangement to Fuller's. I repeatedly expressed that opinion long before Mr. M'RAE had seen your springs (as I believe) and entertain it still."
WM. PARKER,
Gen'l Supt. of Baltimore and Ohio R. R.

Office of Sup't Norwich & Worcester R.R. Co. }
December 26, 1849. }

"I most fully concur in the opinion of Jno. McRae, Engineer of S. Carolina Railroad, that 'Rays Springs are inferior to Fuller's Springs,' and shall with pleasure recommend them to all Railroad Companies for adoption. I have used both springs on this road and have no hesitation in saying that I should in all cases prefer Fuller's Spring."

SAM'L H. P. LEE, JR.,
Sup't and Engineer.

Office B. & P. R. R. Co., }
Boston, 20th December, 1849. }

"This company have cars fitted up with both Ray's and Fuller's 'Metallic India Rubber Springs,' and I do not hesitate to say that Fuller's arrangement is very much superior to Ray's."

W. RAYMOND LEE, Supt.

The following result has been obtained by experiment upon one railroad.

A set of Trucks fitted
with Steel Springs cost \$190-77 and weigh 2355 lbs.
The same with Fuller's
Springs, . . . 131-71 " 1911 lbs.

Difference, . . . \$59-06 " 444 lbs.

Not only is there an advantage in the cost, but owing to the great reduction in weight, the car can be made lighter throughout, and so an enormous saving in weight may be effected in a Train.

G. M. KNEVITT, 38 Broadway, N. Y.,
General Agent for the U. S.

The Springs can also be had of
JAMES LEE & CO., 18 India Wharf, Boston, &
JAS. THORNLEY, 110 Chestnut St., Philad.
January 2, 1850.

Wanted,

A Second Hand Locomotive, weighing from 10 to 12 tons. It is required that in answer, it will be stated, whether the engine has inside or outside connections—the price of the same delivered at Portland, Maine, and terms of payment expected. Address

VIRGIL D. PANIS,
President Buckfield Branch Railroad,
Portland, Maine.

November 10, 1849.

3145

The New York Iron Bridge Co.

LATELY KNOWN AS

Rider's Patent Iron Bridge Co.

THE Company which has hitherto furnished these Bridges, under the patent granted to the late Nathaniel Rider, deceased, have become satisfied that all the principles embraced in their construction, are included in a previous patent, granted in the year 1839, to Col. Stephen H. Long, of U. S. Engineers, and by him designated as "Long's Suspension Bridges," and have therefore made an arrangement with Col. Long, by which they have secured the exclusive right to make and vend these Bridges throughout the whole United States.

The only change consequent upon the new arrangement will be found in the name and style of the Company. The parties composing it being the same, the construction of the Bridges will be essentially the same. August 4th, 1849. M. M. White, Agent, au7tf No. 74 Broadway, New York.

To Contractors.

BLUE RIDGE TUNNEL.—The Contractor for the BLUE RIDGE TUNNEL, having failed to come forward and comply with his engagements, notice is hereby given that PROPOSALS will again be received at the Office of the Board of Public Works, until the 21st of January, 1850, for the construction of the Tunnel and approaches.

The Tunnel will be 4260 feet long, 21 feet high and 16 feet wide, with a ditch on each side; it will pass 700 feet under the top of the Mountain and decline from West to East at the rate of 70 feet to the mile. The approaches will be in the aggregate about 2000 feet long, and consist of deep cuts, high embankments, some walling and bridging.

Proposers who have not already examined the localities will do well to call at the office of the Engineer, on the spot, where they will obtain all necessary information.

The payments will be CASH, with a reservation of 20 per cent till the entire completion of the work; besides which, the contractor is required by law to give bond, with satisfactory bond and security in Virginia. The amount of the bond required will be thirty thousand dollars.

The best testimonials and an energetic prosecution of the work are expected: the contract and bond to be executed within ten days after the letting, and the work to begin *bona fide* within sixty days after the same period.

C. CROZET.

Engineer Blue Ridge Railroad.

Terms of proposals and specifications may be obtained at both offices.

NOTICE TO**Superintendents of Railroads.**

TYLER'S PATENT SAFETY SWITCH.—The undersigned would respectfully call their attention to his Patent Safety Switch, which from long trial and late severe tests has proved itself perfectly reliable for the purpose for which it was intended. It is designed to prevent the train from running off when the switch is set to the wrong track by design or accident. The single rail or gate switch is established as the best and safest switch for the ordinary purpose of shifting cars from one track to another, but it is liable to the serious evil of having one track open or broken when connected with the other. My improvement entirely removes this evil, and while it accomplishes this important office, leaves the switch in its original simplicity and perfection of a plain unbroken rail, connecting one track with the other ready for use.

The following decision of the Commissioner of Patents is respectfully submitted to Railroad Engineers, Superintendents, and all others interested in the subject.

(COPY.)

UNITED STATES PATENT OFFICE, }
Washington City, D.C., April 28th, 1846. }

Sir: You are hereby informed that in the case of the interference between your claims and those of Gustavus A. Nicolls, for improvements in safety switches—upon which a hearing was appointed to take place on the 3d Monday in March, 1846, the question of priority of invention has been decided in your favor. Inclosed is a copy of the decision. The testimony in the case is now open to the inspection of those concerned.

Yours respectfully, EDMUND BURKE,
Commissioner of Patents.

To Philo B. Tyler.

Any further information may be obtained by addressing P. B. TYLER, Springfield, Mass., or JOHN PENDLETON, Agent, 149 Hudson St., New York. 344

To Railroad Companies and Contractors.

FOR SALE.—Two Locomotive Engines and Tenders, at present in use on the Beaver Meadow Railroad, being too light for their coal trains, but well calculated for either gravel or light passenger trains.

They weigh, in running order, about 8 tons each—having one pair of driving wheels 4 feet diameter, 4 truck wheels 30 inches diameter, with cylinders 10 in. diameter, and 18 inches stroke of piston. Tenders on 4 wheels. Address JAMES ROWLAND,

Prest. Beaver Meadow Railroad & Coal Co., Philadelphia.

or, L. CHAMBERLAIN, Sec'y, at Beaver Meadow, Pa.

May 19, 1849.

ENGINEERS.**Arrowsmith, A. T.,**

Buckfield Branch Railroad, Buckfield, Me.

Banks, C. W.,

Civil Engineer, Vicksburg, Miss.

Berrien, John M.,

Michigan Central Railroad, Marshall, Mich.

Buckland, George,

Troy and Greenbush Railroad.

Clement, Wm. H.,

Little Miami Railroad, Cincinnati, Ohio.

Cozzens, W. H.,

Engineer and Surveyor, St. Louis, Mo.

Davidson, M. O.,

Eckhart Mines, Alleghany Co., Maryland.

Fisk, Charles B.,

Cumberland and Ohio Canal, Washington, D. C.

Felton, S. M.,

Fitchburgh Railroad, Boston, Mass.

Floyd-Jones, Charles,

South Oyster Bay, L. I.

Gzowski, Mr.,

St. Lawrence & Atlantic Railroad, Montreal, Canada.

Gilbert, Wm. B.,

Rutland and Burlington Railroad, Rutland, Vt.

Grant, James H.,

Nashville and Chattanooga R. R., Nashville, Tenn.

Harry, P.,

Binghamton, New York.

Holcomb, F. P.,

Southwestern Railroad, Macon, Ga.

Higgins, B.,

Mansfield and Sandusky Railroad, Sandusky City, O.

Johnson, Edwin F.,

New York and Boston Railroad, Middletown Ct.

Latrobe, B. H.,

Baltimore and Ohio Railroad, Baltimore, Md.

Sours, Peter,

Dauphin and Susquehanna Coal Co., Dauphin, Pa.

Miller, J. F.,

Worcester and Nashua Railroad, Worcester, Mass.

Morris, Elwood,

Schuylkill Navigation, Schuylkill Haven, Pa.

Morton, A. C.,

Atlantic and St. Lawrence Railroad, Portland, Me.

McRae, John,

South Carolina Railroad, Charleston, S. C.

Nott, Samuel,

Lawrence and Manchester Railroad, Boston.

Prichard, M. B.,

East Tennessee and Georgia R. R., Cleveland, Tenn.

Reynolds, L. O.,

Central Railroad, Savannah, Ga.

Roebbling, John A.,

Trenton, N. J.

Roberts, Solomon W.,

Ohio and Pennsylvania Railroad, Pittsburgh, Pa.

Robinson, James P.,

Androscoggin & Kennebec Railroad, Waterville, Me.

Schlatter, Charles L.,

Northern Railroad (Ogdensburg), Malone, N. Y.

Stark, George.,

Bost., Con. and Mont. R. R., Meredith Bridge, N. H.

Steele, J. Dutton,

Pottstown, Pa.

Trimble, Isaac K.,

Philad., Wil. & Baltimore Railroad, Wilmington, Del.

Tinkham, A. W.,

United States Fort, Bucksport, Me.

Thomson, J. Edgar.,

Pennsylvania (Central) Railroad, Philadelphia.

Whipple, S.,

Civil Engineer and Bridge Builder, Utica, N. Y.

Williams, E. P.,

Auburn and Schenectady Railroad, Auburn, N. Y.

Williams, Charles H.,

Milwaukee, Wisconsin.

Wormeley, Preble,

Central Ohio Railroad, Zanesville, Ohio.

BUSINESS CARDS.

Cumberland, (Md.) Coals for Steaming, etc.

ORDERS RECEIVED FOR AND FILLED by J. COWLES, 37 Wall St., N. Y.

George O. Robertson,

Broker in Scotch and American Pig Iron;

Bar Iron, Lead, Spelter, Tin, Copper, etc.,

NO. 4 LIBERTY PLACE, MAIDEN LANE,

(Near Broadway.)

NEW YORK

DUNLAP'S HOTEL,

On the European Plan,

NO. 135 FULTON STREET,

Between Broadway and Nassau St.,

NEW YORK.

Manufacture of Patent Wire ROPE AND CABLES,

For Inclined Planes, Suspension Bridges, Standing

Rigging, Mines, Cranes, Derrick, Tillers, &c., by

JOHN A. ROEBLING, Civil Engineer,

TRENTON, N. J.

Samuel D. Willmott,

MERCHANT, AND MANUFACTURER OF

CAST STEEL WARRANTED SAWS,

IMPORTER OF THE

GENUINE WICKESLY GRINDSTONES,

NO. 8 LIBERTY STREET,

NEW YORK.

Doremus & Harris,

ANALYTICAL & CONSULTING CHEMISTS,

179 BROADWAY, NEW YORK.

SCHOOL OF CHEMISTRY.

Dudley B. Fuller & Co.,

IRON COMMISSION MERCHANTS,

No. 139 GREENWICH STREET,

NEW YORK.

Manning & Lee,

GENERAL COMMISSION MERCHANTS,

NO. 51 EXCHANGE PLACE,

BALTIMORE.

Agents for Avalon Railroad Iron and Nail Works.
Maryland Mining Company's Cumberland Coal 'CED'
—'Potomac' and other good brands of Pig Iron.

**Railroad Car Manufacturer's
Furnishing Store.****F. S. & S. A. MARTINE,**

IMPORTERS AND MANUFACTURERS OF

**RAIL ROAD CAR &
CARRIAGE LININGS,**PLUSHES, CURTAIN MATERIALS, ETC.,
112 WILLIAM ST., NEAR JOHN.3-4 and 6-4 Damasks, Union and Worsted; Mo-
reens, Rattinets, Cloths, Silk and Cotton Velvets,
English Bunting**Walter R. Johnson,**CIVIL AND MINING ENGINEER AND AT-
torney for Patents. Office and Laboratory, F St.,
opposite the Patent office, Washington, D. C.**S. W. Hill,**Mining Engineer and Surveyor, Eagle River,
Lake Superior.**Starks & Pruyn,**MANUFACTURERS OF ALL KINDS OF
STEAM BOILERS,

52 and 54 Liberty, corner of Pruyn street

Nathan Starks, Special Partner
Wm. F. Pruyn, **ALBANY.** R. H. Pruyn.
Iron Railing, Bank and Vault Doors, Iron Shutters
Bridge and Roof Bolts, Heavy Jobbing and Forging
of all kinds.

For particulars see Adv. in another column.

To Engineers and Surveyors.E. BROWN AND SON Mathematical inst. mak-
ers No. 27 Fulton Slip, New York, make and keep
for sale, Theodolites, Levelling inst., Levelling rods,
Surveyors Compasses, and Chains, Cases of Mathe-
matical drawing insts. various qualities, together with
a general assortment of Ivory Scales and small insts.
generally used by Engineers.**Samuel Kimber & Co.,****COMMISSION MERCHANTS**
WILLOW ST. WHARVES, PHILADELPHIA.AGENTS for the sale of Charcoal and Anthracite
Pig Iron, Hammered Railroad Car and Locomo-
tive Axles, Force Pumps of the most approved con-
struction for Railroad Water Stations and Hydraulic
Rams, etc., etc.

July, 27, 1849.

James Herron, Civil Engineer,OF THE UNITED STATES NAVY YARD,
PENSACOLA, FLORIDA.,

PATENTEE OF THE

HERRON RAILWAY TRACK.Models of this Track, on the most improved plans,
may be seen at the Engineer's office of the New York
and Erie Railroad.**To Railroad Companies.****—WROUGHT IRON WHEELS—**
SAFETY AND ECONOMY.**NORRIS' LOCOMOTIVE WORKS,**
SCHENECTADY, NEW YORK,Are Manufacturing Wrought Iron Driving, Truck,
Tender, and Car Wheels—made from the best Ameri-
can Iron. Address **E. S. NORRIS.**
May 16, 1849.**Machinery Warehouse.**S. C. HILLS, No. 43 Fulton street, New York, has
constantly for sale Steam Engines, Boilers, Lathes,
Chucks, Drills, Planers, Force and Suction Pumps;
Tenoning, Morticing and Boring Machines, Shingle
Machines, Bolt and Nut Machines, Belting, Oil, Iron
and Lead Pipe; Rubber, Percha and Leather Hose,
&c., &c.S. C. H.'s arrangements with several machine shops
are such that he can supply, at very short notice, large
quantities of machinery.

November 23, 1849.

Cruse & Burke,Civil Engineers, Architects and Surveyors,
Office, New York State Institution of Civil Engineers,
STATE HALL, ALBANY, N. Y.Drawings, specifications and surveys accurately ex-
ecuted. Pupils instructed theoretically and practical-
ly at a moderate premium.
May 26, 1849.**Eaton, Gilbert & Co.,**
Railroad Car, Coach and Omnibus Builders,
TROY, N. Y.**Hudson River Foundry,**
THOMAS & COLLINS,

130 Quay Street, Albany.

To Railroad & Navigation Cos.Mr. M. BUTT HEWSON, Civil Engineer, offers his
services to Companies about to carry out the surveys
or works of a line of Navigation or Railroad. He can
give satisfactory references in New York City as to his
professional qualifications; and will therefore merely
refer here to the fact of his having been engaged for
upwards of two years conducting important Public
Works for the British Government.Communications will find Mr. Hewson at the office
of the Railroad Journal, 54 Wall Street, New York.**Alfred W. Craven,**

Chief Engineer Croton Aqueduct, New York.

Cop Waste.CLEAN COP WASTE, suitable for cleaning Rail-
road, Steamboat and Stationary Engines, con-
stantly on hand and for sale by**KENNEDY & GELSTON,**
54 Pine St., New York.

October 27, 1849,

3m

IRON.**Iron.**Pig Iron, Anthracite and Charcoal; Boiler and Flue
Iron, Spring and Blistered Steel, Nail Rods, Best Re-
fined Bar Iron, Railroad Iron, Car Axles, Nails, Stove
Castings, Cast Iron Pipes of all sizes, Railway Chairs
of approved patterns for sale by**COLEMAN, KELTON & CAMPBELL,**
109 N. Water St., Philadelphia.**IRONDALE PIG METAL, MANUFACTURED**
and for sale by the Bloomsburg Railroad Iron Co.
DUDLEY FISHER, Treasurer.
75 N. Water St., Philadelphia.**Railroad Iron.**500 Tons, afloat, weighing 57 pounds per lineal
yard, for sale by**COLLINS, VOSE & CO.,**
158 South St.

New York, November 17, 1849.

Railroad Iron.THE Undersigned, Agents for Manufacturers, are
prepared to contract to deliver Rails of superior
quality, and of any size or pattern, to any ports of dis-
charge in the United States.**COLLINS, VOSE & CO.,**
158 South St.

New York, November 17, 1849.

Railroad Iron.1600 Tons, weighing 60½ lbs. per yard.
185 " " 57½ "
580 " " 53 "of the latest and most approved patterns. For sale by
BOORMAN, JOHNSTON & CO.,
119 Greenwich street.

New York, Oct. 13, 1849.

Railroad Iron.THE Undersigned have on hand, ready for immedi-
ate delivery, various patterns of Iron Rails, of
best English make, and manufactured in conformity
with special specifications.They offer also to import and contract to deliver
ahead—on favorable terms.**DAVIS, BROOKS, & CO.,**
63 Broad street.

New York, Oct. 11, 1849.

Drawings and Patterns of the most approved
Rail—and specifications of quality and make of same,
are on hand at their office, for examination of parties
who may desire to inspect the same. D., B. & Co.
Oct. 11, 1849.**CUT NAILS OF BEST QUALITY, BAR IRON**
by (including Flat Rails) manufactured and for sale
FISHER, MORGAN & CO.,
75 N. Water St., Philadelphia.**Glendon Refined Iron.**Round Iron, Band Iron, Hoop Iron,
Square " Flat " Scroll "

Axles, Locomotive Tyres,

Manufactured at the Glendon Mills, East Boston, for
sale by **GEORGE GARDNER & CO.,**

5 Liberty Square, Boston, Mass.

Sept. 15, 1849.

3m37

**PATENT HAMMERED RAILROAD, SHIP &
BOAT SPIKES.**—The Albany Iron Works
have always on hand, of their own manufacture, a
large assortment of Railroad, Ship and Boat Spikes
from 2 to 12 inches in length, and of any form of head;
From the excellence of the material always used in
their manufacture, and their very general use for rail-
roads and other purposes in this country, the manu-
facturers have no hesitation in warranting them fully
equal to the best spikes in market, both as to quality
and appearance. All orders addressed to the subscrib-
ers at the works will be promptly executed.**JOHN F. WINSLOW, Agent.**

Albany Iron and Nail Works, Troy, N. Y.

The above Spikes may be had at factory prices, of
Erastus Corning & Co Albany; Merrill & Co., New
York; E. Pratt & Br: 1st, Elmira, Md.**LAP—WELDED
WROUGHT IRON TUBES**

FOR

TUBULAR BOILERS,

FROM 1 1-2 TO 8 INCHES DIAMETER.

These are the ONLY Tubes of the same quality
and manufacture as those so extensively used in
England, Scotland, France and Germany, for Lo-
comotive, Marine and other Steam Engine Boilers**THOMAS PROSSER,**

Patentee.

28 Platt street, New York.

Railroad Iron.THE UNDERSIGNED ARE PREPARED TO
contract for the delivery of English Railroad Iron
of favorite brands, during the Spring. They also re-
ceive orders for the importation of Pig, Bar, Sheet, etc.
Iron.**THOMAS B. SANDS & CO.,**

22 South William street,

February 3, 1849.

New York.

Iron Store.THE Subscribers, having the selling agency of the
following named Rolling Mills, viz: Norristown,
Rough and Ready, Kensington, Triadelphia, Potts-
grove and Thorndale, can supply Railroad Companies,
Merchants and others, at the wholesale mill prices for
bars of all sizes, sheets cut to order as large as 58 in.
diameter; Railroad Iron, domestic and foreign; Loco-
motive tire welded to given size; Chairs and Spikes;
Iron for shafting, locomotive and general machinery
purposes; Cast, Shear, Blister and Spring Steel; Boil-
er rivets; Copper; Pig iron, etc., etc.**MORRIS, JONES & CO.,**

Iron Merchants,

Schuylkill 7th and Market Sts., Philadelphia.

August 16, 1849.

1y33

Railroad Iron.THE MOUNT SAVAGE IRON WORKS, AL-
legany county, Maryland, having recently pass-
ed into the hands of new proprietors, are now prepar-
ed, with increased facilities, to execute orders for any
of the various patterns of Railroad Iron. Communi-
cations addressed to either of the subscribers will have
prompt attention. **J. F. WINSLOW, President**

Troy, N. Y.

ERASTUS CORNING, Albany.**WARREN DELANO, Jr., N. Y.****JOHN M. FORBES, Boston.****ENOCH PRATT, Baltimore, Md.**

November 6, 1849.

Railroad Iron.THE SUBSCRIBERS ARE PREPARED TO
take orders for Railroad Iron to be made at their
Phoenix Iron Works, situated on the Schuylkill Riv-
er, near this city, and at their Safe Harbor Iron Works,
situated in Lancaster County, on the Susquehanna
river; which two establishments are now turning out
upwards of 1800 tons of finished rails per month.Companies desirous of contracting will be promptly
supplied with rails of any required pattern, and of the
very best quality.**REEVES, BUCK & CO.,**

45 North Water St., Philadelphia.

March 15, 1849.

Monument Foundry.

A. & W. DENMEAD & SON,
Corner of North and Monument Sts.,—Baltimore,
HAVING THEIR

IRON FOUNDRY AND MACHINE SHOP

In complete operation, are prepared to execute faithfully and promptly, orders for Locomotive or Stationary Steam Engines, Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw Mills, Slide, Hand or Chuck Lathes, Machinery for cutting all kinds of Gearing, Hydraulic, Tobacco and other Presses, Car and Locomotive patent Ring Wheels, warranted,

Bridge and Mill Castings of every description, Gas and Water Pipes of all sizes, warranted, Railroad Wheels with best faggotted axle, furnished and fitted up for use, complete

Being provided with Heavy Lathes for Boring and Turning Screws, Cylinders, etc., we can furnish them of any pitch, length or pattern.

Old Machinery Renewed or Repaired—and Estimates for Work in any part of the United States furnished at short notice.

June 8, 1849.

Iron Wire.

REFINED IRON WIRE OF ALL KINDS,
Card, Reed, Cotton-flyer, Annealed, Broom, Buckle, and Spring Wire. Also all kinds of Round, Flat or Oval Wire, best adapted to various machine purposes, annealed and tempered, straightened and cut any length, manufactured and sold by

ICHABOD WASHBURN.

Worcester, Mass., May 25, 1849.

American and Foreign Iron.

FOR SALE.

300 Tons A 1, Iron Dale Foundry Iron.

100	"	1,	"	"	"
100	"	2,	"	"	"
100	"	"	"	Forge	"
400	"	"	"	Wilkesbarre	"
100	"	"	"	"Roaring Run" Foundry Iron.	"
300	"	"	"	Fort	"
50	"	"	"	Catoctin	"
250	"	"	"	Chikiswalungo	"
50	"	"	"	"Columbia" "chilling" iron, a very superior article for car wheels.	"
75	"	"	"	"Columbia" refined boiler blooms.	"
30	"	"	"	1 x 1/2 Slit iron.	"
50	"	"	"	Best Penna. boiler iron.	"
50	"	"	"	"Puddled"	"
50	"	"	"	Bagnall & Sons refined bar iron.	"
50	"	"	"	Common bar iron.	"

Locomotive and other boiler iron furnished to order.

New York. **GOODHUE & CO.,**
64 South street

American Pig, Bloom and Boiler Iron.

HENRY THOMPSON & SON,
No 57 South Gay St., Baltimore, Md.,
Offer for sale, *Hot Blast* Charcoal Pig Iron made at the *Catoctin* (Maryland), and *Taylor* (Virginia), *Furnaces*; *Cold Blast* Charcoal Pig Iron from the *Cloverdale* and *Catawba*, Va., Furnaces, suitable for *Wheels* or *Machinery* requiring *extra* strength; also *Boiler* and *Flue* Iron from the mills of *Edge & Hilles* in Delaware, and *best quality Boiler Blooms* made from *Cold Blast* Pig Iron at the *Shenandoah Works*, Va. The productions of the above establishments can always be had at the lowest market prices for approved paper.

American Pig Iron of other brands, and *Rolled* and *Hammered Bar* Iron furnished at lowest prices. Agents for *Watson's Perth Amboy Fire Bricks*, and *Rich & Cos.* New York Salamander Iron Chests.
Baltimore, June 14, 1849. 6 mos

LAP-WELDED WROUGHT IRON TUBES
for Tubular Boilers, from 1 1/2 to 15 inches diameter, and any length not exceeding 17 feet—manufactured by the Caledonian Tube Company, Glasgow, and for sale by
IRVING VAN WART,
12 Platt street, New York.

JOB CUTLER, Patentee.

These Tubes are extensively used by the British Government, and by the principal Engineers and Steam Marine and Railway Companies in the Kingdom.

Railroad Iron.

THE TRENTON IRON COMPANY ARE NOW turning out one thousand tons of rails per month, at their works at Trenton, N. J. They are prepared to enter into contract to furnish rails of any pattern, and of the very best quality, made exclusively from the famous Andover iron. The position of the works on the Delaware river, the Delaware and Raritan canal, and the Camden and Amboy railroad, enables them to ship rails at all seasons of the year. Apply to

COOPER & HEWITT, Agents.
October 30, 1848. 17 Burling Slip, New York.

Pig and Bloom Iron.

THE Subscribers are Agents for the sale of numerous brands of Charcoal and Anthracite Pig Iron, suitable for Machinery, Railroad Wheels, Chains, Hollowware, etc. Also several brands of the best Puddling Iron, Juniata Blooms suitable for Wire, Boiler Plate, Axe Iron, Shovels, etc. The attention of those engaged in the manufacture of Iron is solicited by

A. WRIGHT & NEPHEW,
Vine Street Wharf, Philadelphia.

Iron.

THE SUBSCRIBERS having resumed the agency of the New-Jersey Iron Company, are prepared to execute orders for the different kinds and sizes of Iron usually made at the works of the company, and offer for sale on advantageous terms.—

150 tons No. 1 Boonton Foundry Pig Iron.

100	"	No. 2	do.	do.
300	"	Nos. 2 & 3	Forge	do.
100	"	No. 2	Glendon	do.
140	"	Nos. 2 & 3	Lehigh Crane	do.
100	"	No. 1	Pompton Charcoal	do.
100	"	New-Jersey	Blooms	
50	"	New-Jersey	Faggoting Iron, for shafts	
		Best Bars,	1/2 to 4 inch by 1/2 to 1 inch thick.	
		Do do	Rounds and Squares, 1/2 to 3 inch.	
			Rounds and Squares, 3-16 to 1 inch.	
		Half Rounds,	1/2 to 1 in. Ovals & Half Ovals 1/2 to 1 1/2 in.	
		Bands,	1 1/2 to 4 inch. Hoops, 1/2 to 2 inch.	
		Trunk Hoops,	1/2 to 1 1/2 in. Horse Shoe & Nut Iron.	
		Nail Plates,	Railroad Spikes.	

DUDLEY B. FULLER & Co., 139 Greenwich-st. and 85 Broad-st.

WILLIAM JESSOP & SONS' CELEBRATED CAST-STEEL.

The subscribers have on hand, and are constantly receiving from their manufactory,

PARK WORKS, SHEFFIELD,

Double Refined Cast Steel—square, flat and octagon. Best warranted Cast Steel—square, flat and octagon. Best double and single Shear Steel—warranted.

Machinery Steel—round. Best and 2d gy. Sheet Steel—for saws and other purposes.

German Steel—flat and square, "W. I. & S." "Eagle" and "Goat" stamps.

Genuine "Sykes," L Blister Steel. Best English Blister Steel, etc., etc., etc.

All of which are offered for sale on the most favorable terms by **WM. JESSOP & SONS,**

91 John street, New York.

Also by their Agents—

Curtis & Hand, 47 Commerce street, Philadelphia. Alex'r Fullerton & Co., 119 Milk street, Boston.

Sickney & Beatty, South Charles street, Baltimore. May 6, 1848.

SPRING STEEL FOR LOCOMOTIVES, TENDERS AND CARS.—The subscriber is engaged in manufacturing spring steel from 1 1/2 to 6 inches in width, and of any thickness required: large quantities are yearly furnished for railroad purposes, and wherever used its quality has been approved of. The establishment being large, can execute orders with great promptitude, at reasonable prices, and the quality warranted. Address **J. F. WINSLOW, Agent,**
Albany Iron and Nail Works.

JOHNSON, CAMMELL & Co's Celebrated Cast Steel,

AND
ENGINEERING AND MACHINE FILES,
which for quality and adaptation to mechanical uses, have been proved superior to any in the United States. Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their Cyclops Steel Works Sheffield.

JOHNSON, CAMMELL & CO.,
100 William St., New York.

November 23 1849.

American Cast Steel.

THE ADIRONDAC STEEL MANUFACTURING CO. is now producing, from American iron, at their works at Jersey City, N. J., Cast Steel of extraordinary quality, and is prepared to supply orders for the same at prices below that of the imported article of like quality. Consumers will find it to their interest to give this a trial. Orders for all sizes of hammered cast steel, directed as above, will meet with prompt attention.
May 28, 1849.

To Steam Engine Builders.

THE Undersigned offer for sale, at less than half its cost, the following new machinery, calculated for an engine of 62 inches cylinder and 10 feet stroke, viz: 2 Wrought Iron Cranks, 60 inches from centre to centre.

1 Do. do. Connecting Rod Strap.

2 Do. do. Crank Pins.

1 Eccentric Strap.

1 Diagonal Link with Brasses.

1 Cast Iron Lever Beam (forked).

The above machinery was made at the West Point Foundry for the U. S. Steamer Missouri, without regard to expense, is all finished complete for putting together, and has never been used. Drawings of the cranks can be seen on application to

HENRY THOMPSON & SON,

No. 57 South Gay St., Baltimore, Md.

Sept. 12, 1849.

Railroad Instruments.

THEODOLITES, TRANSIT COMPASSES, and Levels, with Fraunhoffer's Munich Glasses, Surveyor's Compasses, Chains, Drawing Instruments, Barometers, etc., all of the best quality and workmanship, for sale at unusually low prices, by

E. & G. W. BLUNT,

No. 179 Water St., cor. Burling Slip.

New York, May 19, 1849.

Mattewan Machine Works.

THE Mattewan Company have added to their Machine Works an extensive LOCOMOTIVE ENGINE department, and are prepared to execute orders for Locomotive Engines of every size and pattern—also *Tenders, Wheels, Axles,* and other railroad machinery, to which they ask the attention of those who wish such articles, before they purchase elsewhere.

STATIONARY ENGINES, BOILERS, ETC., Of any required size or pattern, arranged for driving *Cotton, Woollen, or other Mills,* can be had on favorable terms, and at short notice.

COTTON AND WOOLLEN MACHINERY, Of every description, embodying all the modern improvements, second in quality to none in this or any other country, made to order.

MILL GEARING,

Of every description, may be had at short notice, as this company has probably the most extensive assortment of patterns in this line, in any section of the country, and are constantly adding to them.

TOOLS.

Turning Lathes, Slabbing, Planing, Cutting and Drilling Machines, of the most approved patterns, together with all other tools required in machine shops, may be had at the Mattewan Company's Shops, Fish-kill Landing, or at 39 Pine street, New York.

WM. B. LEONARD, Agent.

NOTICE.

TO BRIDGE BUILDERS, BRIDGE COMPANIES, and Other Individuals and Associations, who have constructed or used Bridges involving the combined principle of *Bracing, Counter-bracing and Trussing* by means of counteracting braces, keys, wedges, screws, etc., as set forth and explained in my Bridge Patent of 1830, in the words following, to wit: "A system of Counter-bracing, by means of which the truss frames are rendered stiff and unyielding, and the bridge kept in uniform action whether loaded or unloaded"—NOTICE is hereby given, that in all cases in which said combined principle has been introduced into bridges, without due license or authority from me, and without my having been duly remunerated therefor, will be regarded as infringements upon my rights and privileges, and that an amicable adjustment and settlement of all my claims in the premises may be effected by prompt application to my duly authorized Agents therefor, viz: Messrs. Clinton, Knight and Brother, of Cincinnati, Ohio, or Daniel A. Webster, Esq., 8 Pell street of the city of New York.

STEPHEN H. LONG, Patentee.

Louisville, December 10, 1849.

To Railroad Companies.

FOR SALE—A Second-hand Locomotive Engine and Tender, of about 10 tons weight, in good order, and warranted to perform well. Any company wanting a cheap engine for a passenger or light burden train, will rarely meet with an opportunity so favorable as the present. The engine and tender are in perfect running order, and will be tested to the satisfaction of any one wishing to purchase. Price \$1,500.

Address **J. B. MOORHEAD,**
Frazer P.O., Chester county, Pa.

P.S.—The Engine can be seen by calling on H. Osmond & Co., Car-builders, Broad st., Philadelphia.
September 6, 1849.

India-rubber for Railroad Cos.

RUBBER SPRINGS—Bearing and Buffer—Fuller's Patent—Hose from 1 to 12 inches diameter. Suction Hose. Steam Packing—from 1-16 to 2 in. thick. Rubber and Gutta Percha Bands. These articles are all warranted to give satisfaction, made under Tyer & Helm's patent, issued January, 1849. No lead used in the composition. Will stand much higher heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of railroads do not be overcharged by pretenders.

HORACE H. DAY,
Warehouse 23 Courtland street.
New York, May 21, 1849.

Fire Brick.

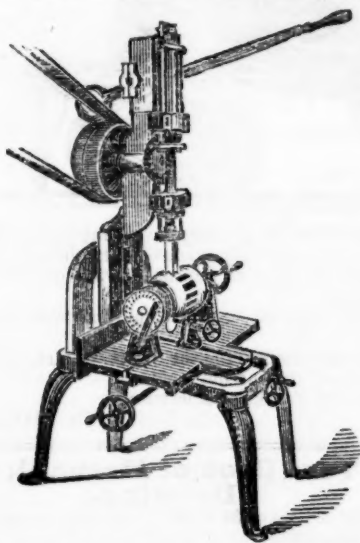
THE Subscribers have constantly on hand Rafford's Stourbridge, Oak Farms Stourbridge, Lister, Wortley, Red and White Welsh Fire Bricks, common and fancy shapes. Also,

ROOFING SLATES,
from the best Welch quarries, and of all sizes. Also,
COAL,

of all kinds—Liverpool Orrell and Cannel, Scotch, New Castle, Pictou, Sidney, Cumberland, Virginia, and all kinds of Anthracite coals. Also,

Pig Iron, Salt, etc., etc., for sale at the lowest market price. Apply to

SAMUEL THOMPSON & NEPHEW,
275 Pearl and 43 Gold Sts., New York.
November, 23, 1849.

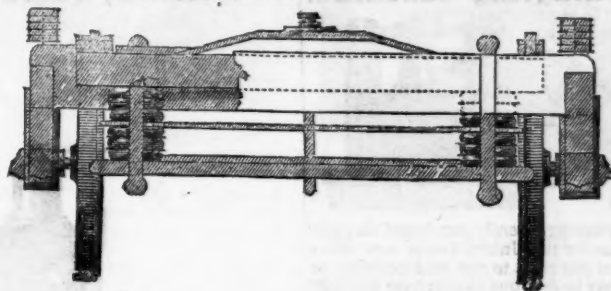
**Capt. Alfred Swingle's
PATENT BORING
& MORTISING MACHINE.**

The above Machine was invented by A. SWINGLE, of Texas, in 1846, and Letters Patent were taken out in July, 1848. As a labor saving Machine it stands unrivalled even in these days of improvements. Its uses are innumerable; it may be successfully applied to Doors, Sashes, Carriages, Wheel-Hubs, and in fact to all kinds of work where the Auger and Chisel can be brought to bear.

The only limit to the speed of the working of this machine is the heating of the tools used. It will perform at least the labor of twelve men, and in vastly better manner, and can be worked equally well by steam power or by hand. It has been used and has given universal satisfaction.

For further information apply to H. B. TEBBETTS, 40 Wall St., New York, to whom all orders are to be addressed.

New York, December 15, 1849.

**FULLER'S PATENT
INDIA RUBBER CAR SPRINGS.**

RAILROAD COMPANIES are cautioned, before purchasing Springs, to examine the actual patents and judge for themselves.

Persons, under the Title of the New England Car Company, seeking fraudulently to invade Fuller's rights, have put forth so many statements for the purpose of misleading the public, that an enumeration of some facts is absolutely necessary, for the purpose of putting persons interested upon their guard.

Fuller's patent is for the application of Discs of India-rubber with Metal Plates, for forming Springs for Railway Cars and Carriages—either one disc and two plates, or ten discs and plates, or any other number, are equally covered by the patent. Fuller is not bound to the use of short discs—he may use long discs and plates.

Ray's patent is simply and wholly the forming of air tight rubber cylinders, with hoops or bands round the outside, and the combination of elasticity of India rubber, with the elasticity of atmospheric air confined in the cylinder, and in no part of his patent is he authorized to use the form of spring which he is now fraudulently supplying to Railroad Companies. Such springs are direct and positive infringements of the very letter of Fuller's patent.

Fuller's patent is dated October, 1845, Ray's patent, August, 1848.

The spring patented by Ray never has been put in operation, and never can be made useful for Railroad cars.

A mere experiment, even if made, it is well known does not prove an invention; and it is ridiculous for such parties to hope to mislead the Presidents and Superintendents of Railroad companies, by claiming the invention because Ray alleges he made an experiment—which Fuller had made before him—had actually brought into working order, and obtained a patent for—and this too before Mr. Ray states he made his experiment—and that experiment not claimed to have been applied to a car or carriage.

Besides, the invention could not have been developed until India rubber, properly Vulcanised, could be made of a sufficient thickness. In the United States the art of vulcanising rubber by steam heat, (by which

means only can a body of rubber having any considerable thickness be vulcanised,) was not introduced until after the grant by the American government of the patent for springs to Fuller—whereas the process of vulcanising rubber by steam heat was invented in England about three years previously, and was used by Fuller there. This fact refutes entirely the claim of invention put forth by Mr. Ray, and proves the impossibility of his pretensions being true.

Fuller was the first and only inventor of the spring. A Mr. Dorr, whose connection with Mr. Goodyear is well known in this country, applied in England to Mr. Fuller, after he had published and patented his invention, and introduced another party for the purpose of obtaining the agency for the United States. They were furnished with a complete set of drawings and models, and with instructions to make arrangements for the supply of material of American manufacture—from that hour to the present not a single communication has been received from them. Some of these identical models have been traced into the hands of parties now seeking to invade Fuller's rights, and who have exhibited them as specimens of their own invention.

After this, the conveyance was made by Goodyear to certain parties here for the use for railroad springs of what he calls his Metallic rubber. Comment is unnecessary.

There are 5 or 6 different processes for the manufacture of vulcanised rubber, patented by as many different parties, some here, some in England, either of which would probably make good springs.

A large and powerful company has been organized under Fuller's patent, the particulars of which shall be given very shortly.

An action has been commenced against three railroad companies for infringement; and all other parties will assuredly be prosecuted if they continue farther to infringe upon Fuller's patent.

W. C. FULLER,

The only persons authorised to supply the Springs are
G. M. KNEVITT, 38 Broadway, N. York,
General Agent for the U. S.; and
JAS. LEE & Co., 18 India Wharf, Boston.
JOHN THORNLEY, Chestnut st., Philad.

**Arch St. Machine Shop.
BIRKENBINE, MARTIN & TROTTER,**
Makers of

STEAM ENGINES,
and
HYDRAULIC MACHINERY,
NO. 16 ARCH STREET,
PHILADELPHIA.

Will construct Steam Engines, Pumps, for Draining Mines and Land; supplying Water to Towns, Factories, Farms, etc;
Also, Street Stops, Fire Plugs, Water Tanks, and Hydraulic Rams, with
(BIRKENBINE'S PATENT VALVES.)
B., M. & T. contract for Warming and Ventilating Buildings by Steam or Warm Water.

J. E. Mitchell,
NO. 14 OLD YORK ROAD, PHILADELPHIA.
Importer and manufacturer of

New Castle	{	Grindstones, of all sizes and grits.
Nova Scotia		
Wickersly	{	Millstones, made to order, with all the recent improvements.
French Burr		
Cocahoe	{	Fire Bricks and Tiles of various sizes.
Cologne		
American and	{	Burr Blocks, Bolting Cloths, Mill Irons, etc.
Patent compressed		
Garnkirk		

**To the Proprietors of Rolling
Mills and Iron Works.**

THE Undersigned—Proprietors of Townsend's Furnace and Machine Shop, Albany—are extensively engaged in the manufacture of Machinery and fixtures for Iron, and Copper Rolling Mills, and Iron Works. Having paid particular attention to the manufacture of *Rolls* (Rollers), both *chilled* and *dry-sand*, they feel confident that they can execute orders for such castings in a satisfactory manner. And to give assurance of this, they beg leave to refer to the following named persons, proprietors and managers of some of the most extensive rolling mills in the country, viz: Jno. F. Winslow, J. Tuckerman, H. Burden, W. Burt, J. & J. Rogers, Saltus & Co., J. B. Bailey, L. G. B. Cannon, Hawkins & Atwater, etc., etc.

F. & T. TOWNSEND.

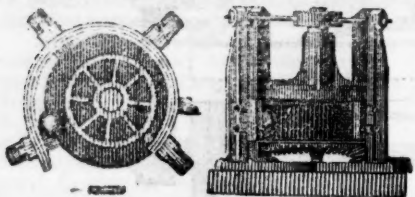
Albany, August 18, 1849.

Steam Boiler Explosions.

THE Subscriber having been appointed sole Agent for Faber's Magnetic Water Gauge, is now ready to supply the trade, and also individuals with this celebrated instrument. Besides the greatest safety from explosion resulting from its use, it is a thorough check against careless stoking and feeding. In marine engines it will regulate the exact quantity required in the "blow off." Pamphlets containing full information, can be had free on application to the Agent:
JOSEPH P. PIRSSON,
Civil Engineer, 5 Wall st.

MACHINERY.

Henry Burden's Patent Revolving Shingling Machine.



THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phoenixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has given universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous: considerable saving in first cost; saving in power; the entire saving of shinglers, or hammermen's wages, as no attendance whatever is necessary, it being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll rounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y.

P. A. BURDEN.

Railroad Spikes and Wrought Iron Fastenings.

THE TROY IRON AND NAIL FACTORY, exclusive owner of all Henry Burden's Patented Machinery for making Spikes, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for Railroad fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

RAILROAD WHEELS.

CHILLED RAILROAD WHEELS.—THE UNDERSIGNED are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of spokes or discs, by a new process which prevents all strain on the metal, such as is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

A. WHITNEY & SON,
Willow St., below 13th,
Philadelphia, Pa.

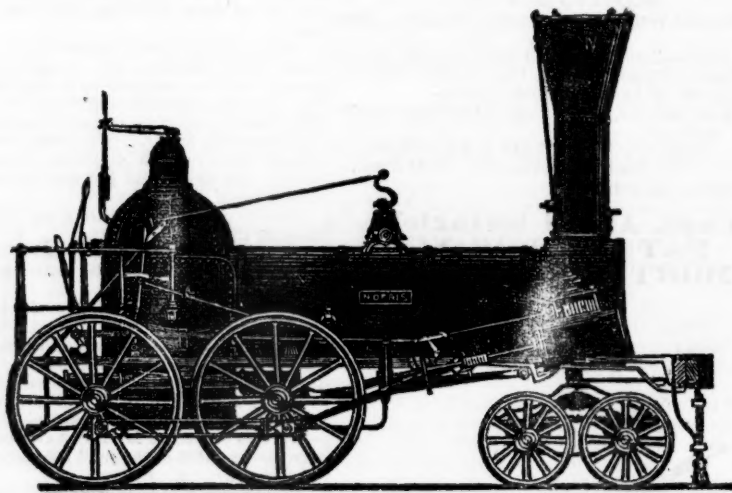
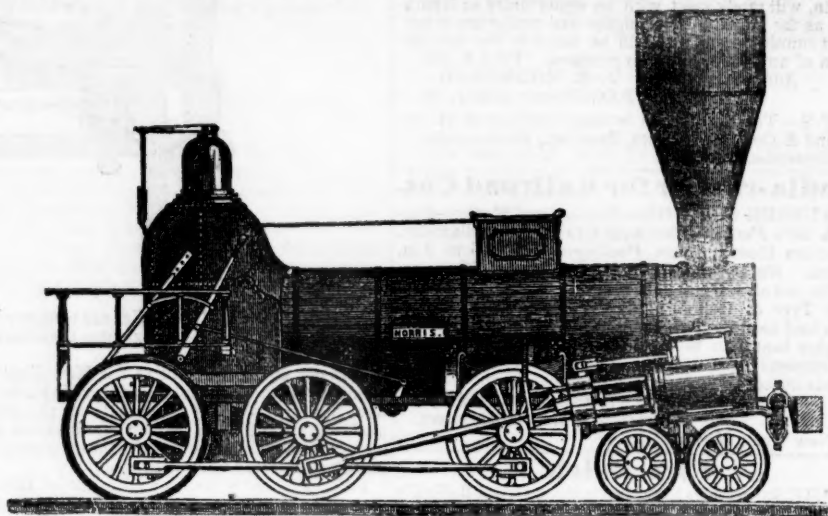
CHILLED RAILROAD WHEELS.—THE UNDERSIGNED, the Original Inventor of the Plate Wheel with solid hub, is prepared to execute all orders for the same, promptly and faithfully, and solicits a share of the patronage for those kind of wheels which are now so much preferred, and which he originally produced after a large expenditure of time and money.

A. TIERS,
Point Pleasant Foundry.

He also offers to furnish Rolling Mill Castings, and other Mill Gearing, with promptness, having, he believes, the largest stock of such patterns to be found in the country.

Kensington, Philadelphia Co.,
March 12, 1848.

A. T.

NORRIS' LOCOMOTIVE WORKS.
BUSHHILL, SCHUYLKILL SIXTH-ST., PHILADELPHIA,

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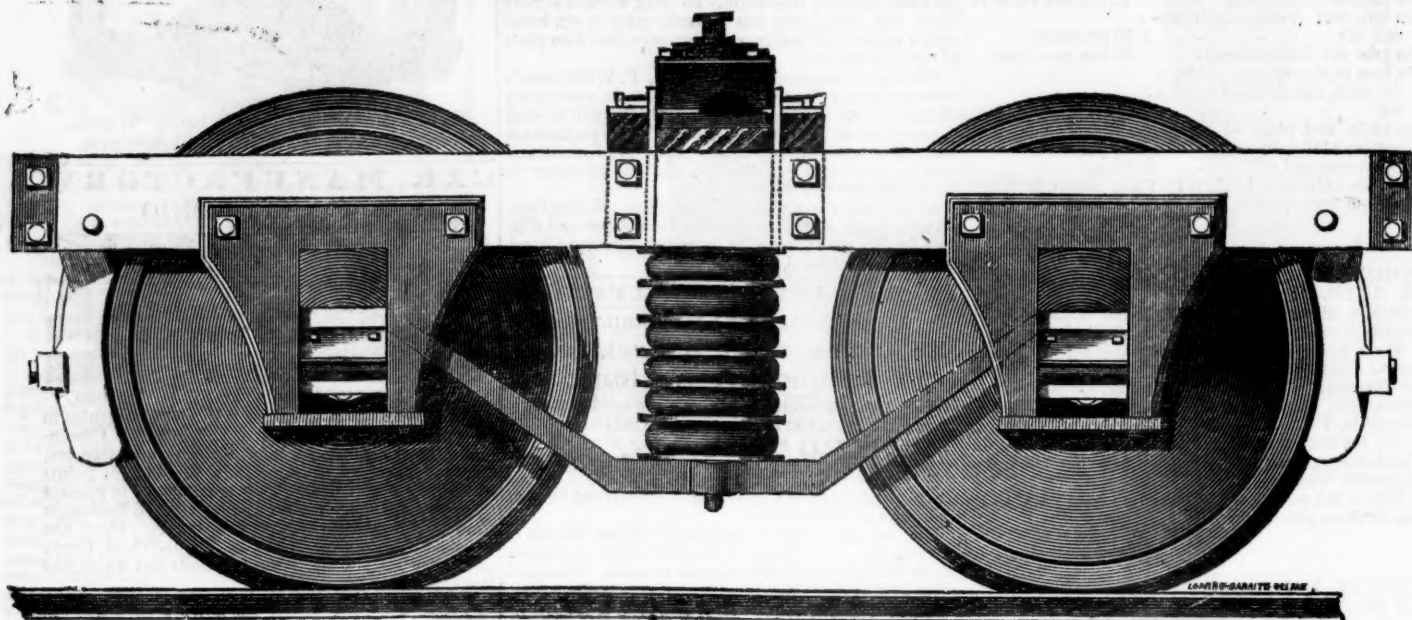


Fig. 1.

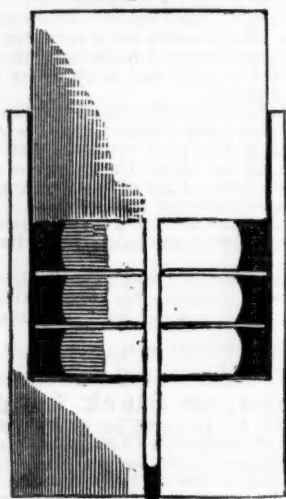


Fig. 2.

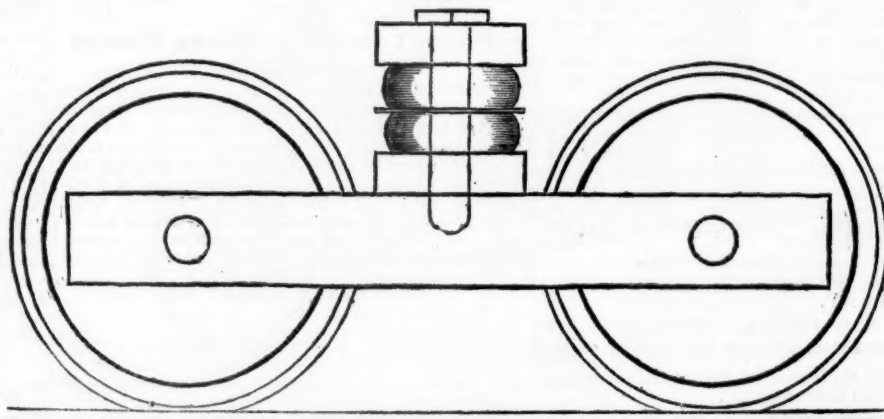


Fig. 3.

So much has been published for the purpose of misleading the public in regard to the inventorship of the India-rubber Railroad Spring, patented in the United States by Mr. W. C. Fuller, that the New England Car Company, proprietors of this invention, have deemed it proper, for the information of Railroad Companies, Car Builders and the public generally, to lay before them the facts upon which they found their claim to this invention, and to a Patent therefor.

Cut No. 1, Represents a cross section of the first model made by Mr. Tucker, under the direction of Mr. Ray, in the summer of 1844, and to which Mr. Tucker, Mr. Bradley and Mr. Bannister testify as being the model marked "B."

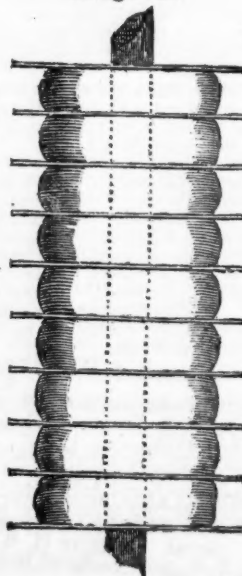
Cut No. 2, Represents the model made in 1845, to which Mr. Osgood Bradley and Gen. Thos. W. Harvey have testified.

Cut No. 3, Represents a rough sketch made by Mr. Ray in 1844, which he gave to a man about departing for England to take out some patents, who promised to write to Ray after his arrival in that country—which promise he has probably forgotten.

Mr. W. C. Fuller, of England, patented the above Spring in that country on the 23d October, 1845. He filed his enrollment April 23d, 1846, and on the 22d October, 1846, he took out a patent in the United States under the title, "For Improvement in Railway Carriages," when the improvement consisted in the spring, and not in the carriage.

The reader will perceive by the annexed testimony, that the India-rubber Railroad Car Spring was invented by Mr. Ray about two years previous to the date of Mr. Fuller's enrollment.

The Depositions are omitted for want of room, but will be published in full in the course of a few weeks.



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